

- Plan and implement the future by guiding the physical and economic development of Dibrugarh town while enhancing the quality of life for all through a comprehensive range of planning to promote the cultural, built and natural heritage in a sustainable manner.
- Expand urban infrastructure to encourage appropriately compact, connected, and synchronized development by unlocking the potential of urbanization for better economic, social, and environmental outcomes at the heart of the government's economic strategy.

11.3.2 GOALS

In the next 25 years, Dibrugarh will grow by half million people and will consolidate its reputation as one of the Most Liveable; Socially Beneficial; Regionally Contextual; Environmentally Sustainable; Financially Viable; Institutionally Executable; Politically Acceptable and Culturally Prosperous areas in Assam for residents, business and visitors."

11.3.3 OBJECTIVES TO ACHIEVE THE VISION

1. To generate higher service facilities for attracting various developmental activities, investors and industrial houses.
2. To generate facilities and activities to support small investors, informal sectors and slum inhabitants and rural migrants.
3. To improve the Transport Network system for faster communication and high standard linkages between the Growth Centers and their rural hinterlands.
4. To transform the whole region to a pollution free zone with conservation of biodiversity and environment.
5. To manage the natural and human resources for followed development.
6. To frame land policies and development proposals for eradicating bottlenecks for future development.
7. To provide decent housing for all sections of people living in the region.
8. To formulate a Disaster Management Policies to tackle natural and manmade hazards.
9. To provide high levels of physical and social infrastructure ensuring safe drinking water, improved sanitation, well distributed education, health, recreation and cultural facilities.
10. To convert the region to a learning and cultural centre for the state as well as nation.
11. To transform the region to a hub of tourism through preserving and promoting the rich cultural heritage and aesthetics of tea gardens, with high standard facilities and convenience.
12. To design an effective development control mechanism with a high value of public serviceability.
13. To reenergize the institutional and administrative system to manage future urban.

11.4 PLANNING THEORIES

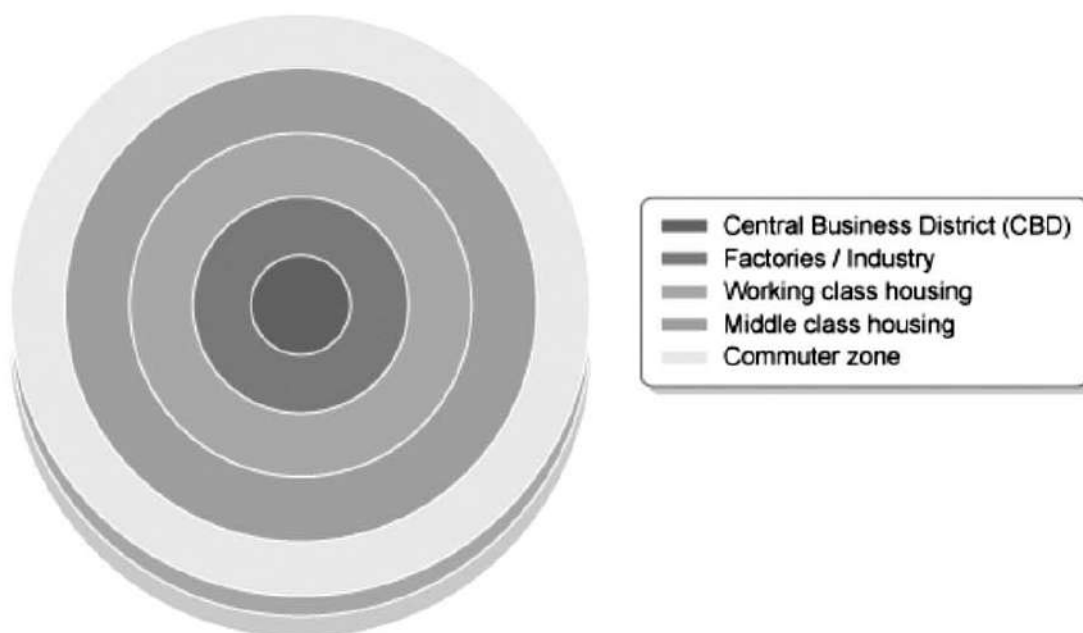
The planning is based on order of settlement, level of urbanization, planning area morphology it's evident that the growth over the last few decades are spearheaded due to certain factors like spatial organization of the several urban functions of commerce, production, education, and much more. One of the most important forces determining where certain activities or growth is focused within a city deals with the price of land. Thus, it is important to understand different urban models developed over the course of time. The different planning theories are explained in the following section to understand which theoretical model suits best for the planning area.

11.4.1 CONCENTRIC ZONE MODEL

The Concentric Zone model is a model of the internal structure of cities in which social groups are spatially arranged in a series of rings. The concentric zone model was resulted from a study of Chicago in the 1920's by Ernest Burgess. This model is also known as Bull's eye Model. The idea behind this model is that the city grows outward from a central area in a series of rings. The size of the rings may vary, but the order always remains the same. Under this model, five concentric functional zones are recognized. At the center was the CBD (1). The zone of transition (2) was characterized by residential deterioration and encroachment by business and light manufacturing. The zone of independent workers' homes (3) was primarily occupied by the blue collar (wage-earners, manual laborers) labor force. The zone of better residences (4) consisted mainly of the middle-class. Finally, the commuters' zone (5) was the suburban ring, consisting mostly of white-collar workers who could afford to live further from the CBD. This model was dynamic. As the city grow, the inner zones encroached on the outer ones.

Disadvantages:

- This model was developed for American cities and had limited applicability elsewhere.
- The model does not take into account any physical barriers and gentrification - which may occur in the cities.
- It does not address local urban politics and forces of globalization.



11.4.2 SECTOR MODEL

In the late 1930s, Homer Hoyt's sector model was published, partly as an answer to the drawbacks of Burgess' concentric zone model. This model was based both on urban land-use pattern and on demography. Hoyt accepted the existence of business district at the core, but suggested that various groups expand outward from the city centre along railroads, highways and other transportation arteries. As technology dealing with transportation and communication was improving, growth alone created more of a pie-shaped urban structure. Hoyt discovered that land rent (for residential, commercial, or industrial) could remain consistent all the way from the CBD to the city's outer edge.

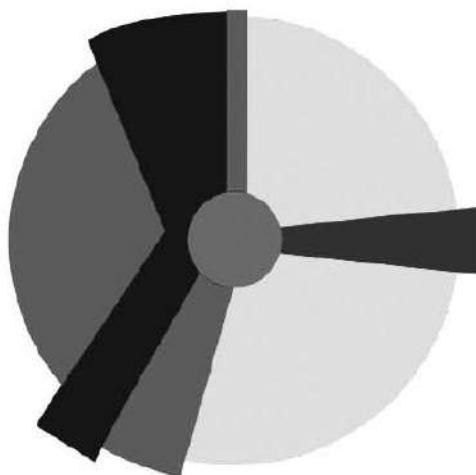
Based on the above observation, Hoyt theorized the following:

- Cities tend to grow in wedge-shaped patterns—or sectors—emanating from the core business district and centered on major transportation routes.
- Higher levels of access meant higher land values; therefore, many commercial activities would be carried on in the central business districts, but manufacturing units would be developed in a wedge surrounding transportation routes.
- Residential areas would grow in a wedge-shaped pattern with a sector of low-income housing bordering manufacturing/industrial sectors (traffic, noise and pollution would make these areas least desirable), while middle and high income households would be located as far away as possible from manufacturing industrial units.

Disadvantages:

- The theory is based on nineteenth century transport and does not make allowances for private cars that enable commuting from cheaper land outside city boundaries. This occurred in Calgary in the 1930's when many near-slums were established outside the city but close to the termini of the street car lines. These are now incorporated into the city boundary but are pockets of low cost housing in medium cost areas.
- No reference is given to out of town development.

Hoyt Sector Model Key



- CBD
- Factories/Industry
- Low class residential
- Middle class residential
- High class residential

11.4.3 MULTIPLE NUCLEI MODEL

In the 1940s, Chauncy Harris and Edward Ullman, arguing that neither of the earlier models adequately reflected city structure, proposed the multiple nuclei model. This model was based on the notion the CBD was losing its dominant position and primacy as the nucleus of the urban area. Several of the urban regions would have their own subsidiary but competing "nuclei." As manufacturing cities became modern cities and modern cities became increasingly complex, these models became less and less accurate.

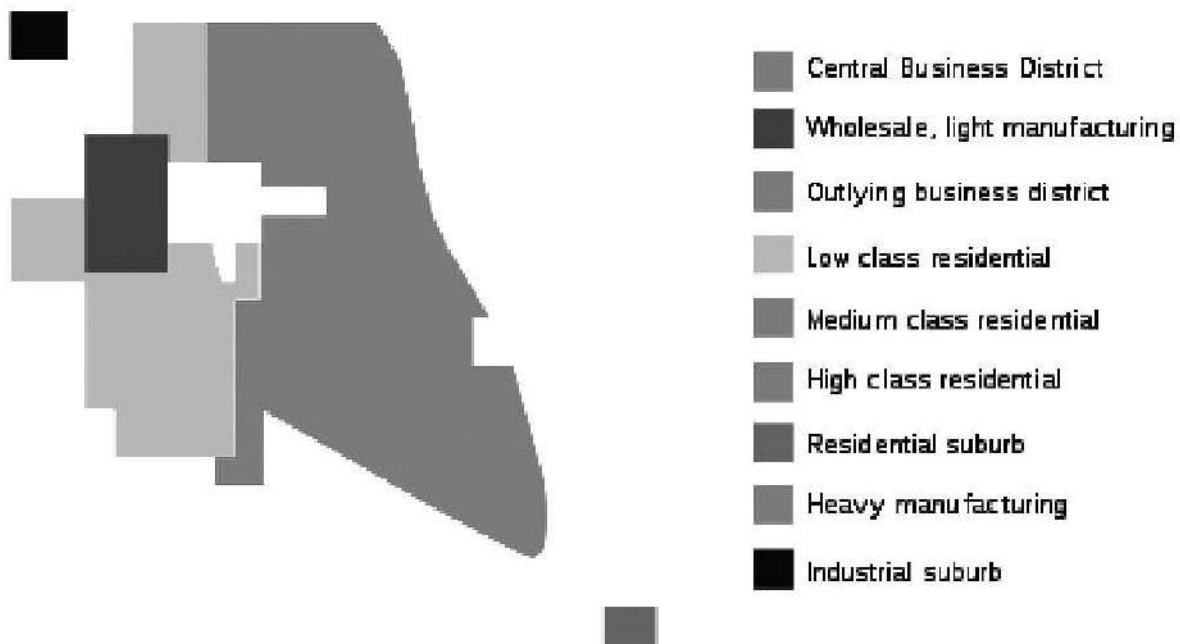
Today, there are urban realms, components of giant conurbations (connected urban areas) that function separately in certain ways but are linked together in a greater metropolitan sphere. In the early postwar period (1950s), rapid population diffusion to the outer suburbs created distant nuclei, but also reduced the volume and level, of interaction between the central city and these emerging suburban cities. By the 1970s, outer cities were becoming increasingly independent of the CBD to which these former suburbs had once been closely tied. Regional shopping centers (e.g., malls) in the suburban zone were becoming the new CBDs of the outer nuclei.

Advantages:

The advantages of this model lie in its multi nuclei approach – many sources give slight variants on the model shown in the diagram, since the model is rather flexible and adapts to local situations (the exact positions of the nuclei are not important but only the basic trends) so it can be modified to match the city under consideration.

Disadvantages :

- Negligence of height of buildings.
- Non-existence of abrupt divisions between zones.
- Each zone displays a significant degree of internal heterogeneity and not homogeneity.
- Unawareness of inertia forces.
- No consideration of influence of physical relief and government policy.
- The concepts may not be totally applicable to oriental cities with different cultural, economic and political backgrounds.



11.4.4 URBAN REALM MODEL

Vance's urban realms model is an extension of the multiple-nuclei model and is based on the San Francisco Bay area but has been applied to other US cities. The key feature is the emergence of large self-sufficient urban areas, each focused on a center independent of the traditional downtown and central city. The area, shape and other characteristics of each realm depends upon the following several factors:

1. The terrain – mountains and rivers and other barriers will help to determine the extent and shape of a region.
2. The size of the metropolis – a larger metropolis may have more and larger realms.
3. The amount of economic activity within each realm – a determinant of the area it can serve and hence its size.
4. The transport infrastructure available within each realm – an easily accessible economic core increases the area of influence and thus size of each realm.

Transport infrastructure between realms – e.g. circumferential links (such as freeways) and airports such that people no longer have to travel to the CBD and its central realm in order to travel to other realms and to another metropolis. If a realm can become more important in this manner, then it may increase in importance. E.g. West Los Angeles is within easy reach of the LAX airport (along the freeway) but to travel by train residents have to travel to the CBD (by bus or car).

Advantages:

- If the city is successful, It can accommodate a large and growing population easily due to its automobile dependence.
- Each realm has its own economic strength, so overall the metropolis can be an economic powerhouse and can become some self-sufficient.

Disadvantages:

If a model fails, then the city displays a large amount of urban sprawl. Urban sprawl is the uncontrolled expansion of urban areas. Urban areas will expand into previously rural areas.

11.4.5 CENTRAL PLACE THEORY

Central Place Theory (CPT) is an attempt to explain the spatial arrangement, size, and number of settlements. The theory was originally published in 1933 by a German geographer Walter Christaller who studied the settlement patterns in southern Germany. In the flat landscape of southern Germany Christaller noticed that towns of a certain size were roughly equidistant. By examining and defining the functions of the settlement structure and the size of the hinterland he found it possible to model the pattern of settlement locations using geometric shapes.

Advantages:

- The theory helps us understand the organization from a theoretical perspective and the spatial distribution.
- Important in Policy Making.

Disadvantages:

- The theory doesn't incorporate the temporal aspect in the development of central places.
- The theory is good for agricultural regions but not industrial or postindustrial regions.

11.4.6 A MODEL BEST SUITED FOR DIBRUGARH

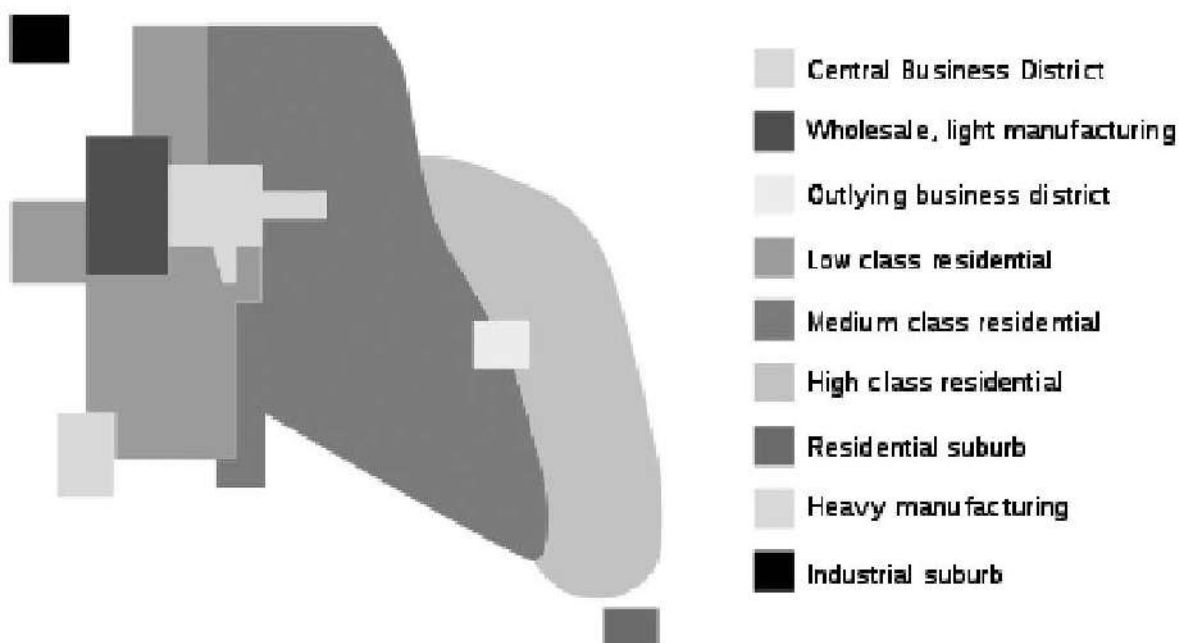
After studying above mentioned theory, following analysis has been conducted.

It is evident that concentric zone model is not suitable for Dibrugarh as it was developed mostly for American cities and does not take into consideration any physical barrier or gentrification. Similarly, Sectoral model is also not applicable to DMPA as there is no allowances for private cars while considering the transportation sector. Additionally, it doesn't include any reference for the development which occurs immediately after town, which is the scenario in almost all Indian cities. In the case of urban realm model, if a model fails, then the city will start developing large amount of urban sprawl. This can't be applicable to Dibrugarh due to the absence of contiguous mass of land. Additionally, in today's context, a city should focus less urban sprawl as a city can't afford to lose its agricultural area. Central place theory is also not applicable to DMPS as it is good for agricultural regions.

Multiple Nuclei Model is best suited for Dibrugarh as it has a unique character of non-contiguous land mass. Additionally, the city has already developed a character where the application of this theory will become inevitable. The Major issues of the city can be solved with Multiple Nuclei Model.

Some of the issues include, the high-level congestion in the core town, increasing urban sprawl and decreasing agricultural land, haphazard development inside the planning area. Additionally, this model is flexible and can fit according to the local condition of a city/town. The other major reasons to adopt the Multi Nuclei Model in Dibrugarh region are listed below.

- Dibrugarh region possess flat terrain.
- Dibrugarh region is a noncontiguous settlement pattern paves the opportunity to develop the decentralization model.
- The administrative boundaries (noncontiguous settlement pattern) itself create the ways to decentralize the core activities from Central Business District.
- Dibrugarh region is sharing the major road network with Assam as well Arunachal regions.
- Multi Nuclei model allows the even distribution of resources allocations.



11.5 GUIDING PRINCIPLES

The principles below further articulate the vision and are to guide planning of the proposed DMPA to achieve the foreseen vision.

11.5.1 TRANSIT ORIENTED DEVELOPMENT (TOD)

Transit oriented development is a mixed-use development integrating planning and implementations of transport and land use. Mixed-use developments include residential, commercial space and office space, or a combination of the same. Generally, mixed-use development is within easy access to transit corridors. Development within easy accessibility to the transit corridors encourages residents and workers to use public transit more often over private vehicles.

11.5.2 URBAN RURAL CONTINUUM

Rural Urban Continuum is essentially the gradual change observed in terms of intensity of development from core city areas towards the peripheral area. The nature of settlement structure helps to understand the rural-urban dichotomy or continuity. In the initial stage, the change can be seen in form of changes in agricultural land use, in terms of high commercialization of agriculture activities. In the later stage, the change can be seen in occupational structure of the rural areas, in terms of when the rural population starts responding to possible employment opportunities in the surrounding urban areas. As time passes, the range of private enterprises would widen to include almost every type of enterprises sectors. Public transport would be the means of commutation, houses would be improved and better furnished; however, the basic amenities such as water supply, sewage disposal and drainage may not show any improvement. In the third and the last stage, changes in urban land use would be observed.

11.5.3 MULTIPLE NUCLEI CONCEPT

Population of metropolitan area will grow along with a growth of the metropolitan area, and so the demand for the infrastructure too will grow. By creating, multiple nuclei centers will help reduce the burden of providing sufficient infrastructure from the metropolitan area. These nuclei centers can be identified based on the physical demarcation and accumulation of cluster of activities. They would not be the absolute population accumulation in a particular area but the service population with different size.

11.5.4 URBAN GROWTH BOUNDARY

Urban growth boundary circumscribes the possible urbanizable and developable area. Local governments would use the boundary as a guide to zoning and land use decisions. The local or regional government does not support development for a specified period beyond an officially adopted and mapped line. Growth is supported inside the boundary with utilities and development-friendly policies. Growth is discouraged outside the growth boundary. The purpose of providing urban growth boundary is to synchronize existing urban growth with the provision of infrastructure needed to accommodate future growth, and to promote compact and contiguous development patterns that can be effectively served by public services; as well as to preserve open space, agricultural land, and environmentally sensitive areas that are not currently suitable for urban development.

11.5.5 PERI URBAN DEVELOPMENT

UNDP (1996) defines peri-urban as an activity that produces processes and markets food and other products, applying intensive production methods and reusing natural resources and urban wastes to yield a diversity of crops and livestock. Peri urban in addition can also involve animal husbandry, aquaculture, agro-forestry and horticulture.

11.5.6 PROVISION OF SOCIO-PHYSICAL AMENITIES

URDPFI guidelines will be base line for foreseeing the socio-physical amenities requirement for the horizon year 2045.

11.6 CONCEPTUAL PLAN DEVELOPMENT

To achieve the vision and goals set for the planning area it is critical to have a concept, which illustrates the long-term direction guided by planning principles.

Several considerations were taken into account while formulating the concept for the planning area, which are listed below.

Socio-demographic Projections

- Current Growth Trends
- Level of Urbanisation
- Stakeholder Meeting Suggestions
- Suggestions from various government organisation, NGOs etc.
- Existing Physical & Social Infrastructure
- Existing Land Use Analysis & Land Availability for Future Development
- Economy of planning area
- Govt. Policies & Future Projects

Based on the various analysis and exploration the nodal points are identified for the projected year 2045. The figure 238 reveals that the identification of growth centers, growth points and location for the Multi Modal Transit Centres in Dibrugarh region. They are detailed in the table 238.

Table 238 Details of Development Centres and Nodal Points

Multi Nuclei Model Dibrugarh Planning Area- 2045		
Sr.No.	Development Centre	Nodal Point
1.	Growth Centre	Lahowal Gaon
		Chengmari Gaon
		Changmari Garia Gaon
2.	Growth Point	Kapor Tepow Gaon
		Lekai Gaon
		Dhekeri Gaon
3.	Transit Hub	Niz - Khanikar

The planning area currently accommodates 3.6 lakhs of population with a gross density of 9 persons per hectare and this population is projected to grow to almost 5.5 Lakhs by 2045. The planning area have certain inherited nodes like the Institutional area, Industrial area, Municipal areas & its outgrowth and the rural hinterland. For ease of planning, the Dibrugarh Planning Area is divided into three zones as mentioned below.

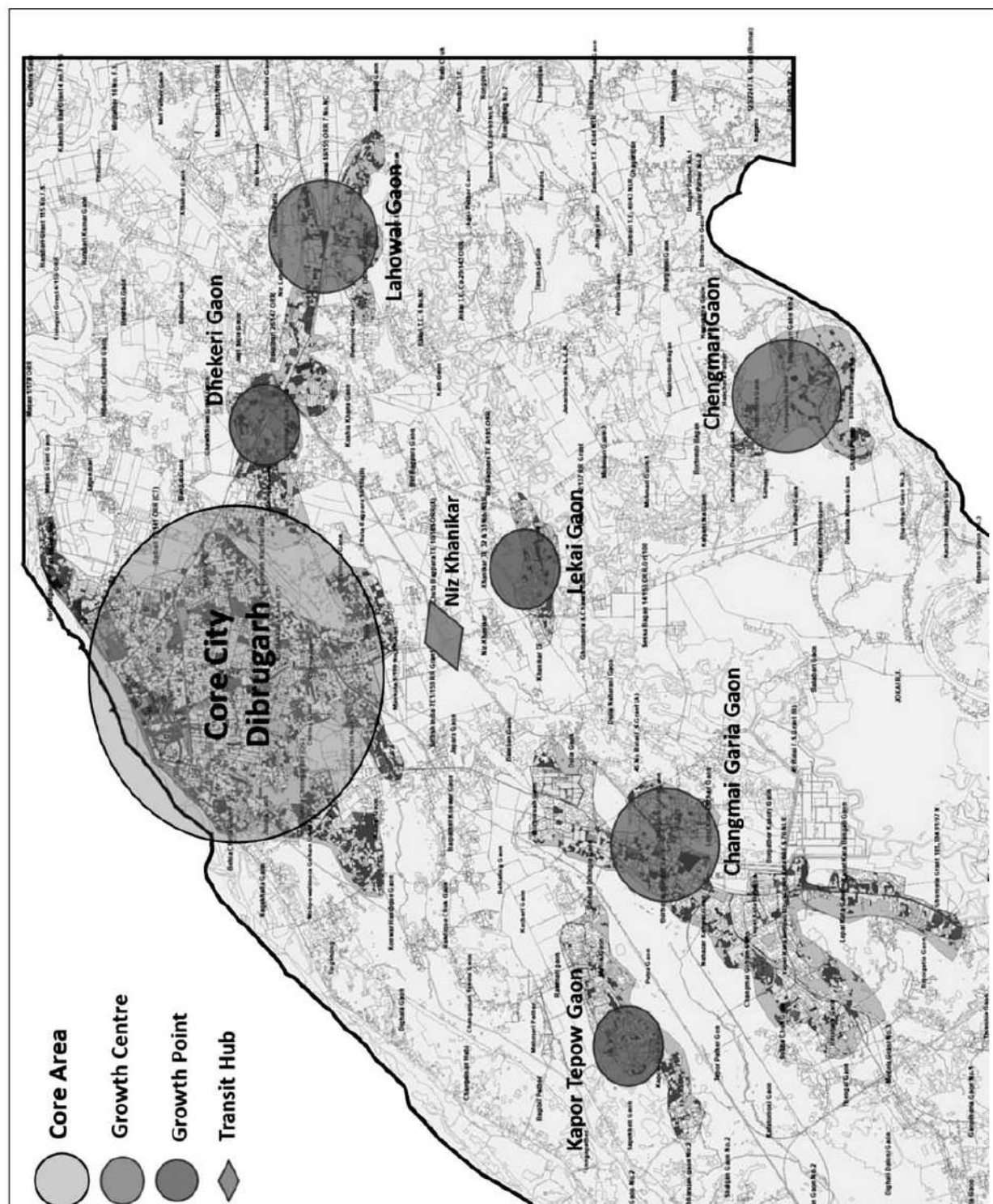


Figure 173 Concept Plan for Dibrugarh Master Plan Area - 2045

11.6.1 CONURBATION AREA

Conurbation area is a continuous urban area comprising of towns and their outgrowths merged with each other due to physical expansion and population growth. In the case of Dibrugarh, proposed conurbation area includes Dibrugarh Municipality, 2 Census Towns (Niz-Mancotta and Barabari AMC area), 2 Outgrowth area (Mohpuwalimora Gohain Gaon and Tekela Chiring Gaon) and 13 Semi Urbanized villages. The continuous development has occurred up to Konwar Handique Village due to existence of NH 37 on western side of Dibrugarh. The continuous development also has occurred due to Mancotta Road in Tepor and Mankota village on southern part of Dibrugarh. This area is also well connected through NH Bypass. The villages included in the conurbation area are listed below.

Table 239 Proposed Conurbation Area 2045

Proposed Conurbation Area - 2045				
Sl.No.	DMB Area	OGs	CTs	13 Semi Urbanized Villages
1	Dibrugarh Town	Mohpuwalimora Gohain Gaon	Niz-Mancotta	Mankota T.E. 1/159
2	Kolihamari	Tekela Chiring	Barabari	Tepor Gaon
3	Niz Kadamoni			Bairagimath Kachari Gaon
				Borbari 12/144
				Borsaikia Gaon
				Japara Gaon
				Rahabheta 135 F.S.
				Sagunibari Gaon
				Chiring Gaon
				Dhekeri Gaon
				Hatimora Gaon
				Komar Gaon
				Suta bogpara 10/165(B)
	3	2	2	13
Total no. of villages covered within Conurbation Area				20

(Source: Consultant Compilation)

11.6.2 EXISTING LAND USE OF CONURBATION AREA

The various industries, the educational and health sectors, trade and commerce and transportation sector are responsible for the city's function. Dibrugarh has been observed to be a multi-functional town having characters of trade and commerce cum industries cum tea farming.

The existing land use pattern of the conurbation area shows the dominance of residential area. It can be observed that a considerable area is under Public-Semi Public use as this land use consists of the administrative and government buildings, educational institutions, medical institutions, social amenities and public utilities being part of this land use. The maximum developed area is on the Northern side of planning area towards the Dibrugarh town. There is a dense network of roads within the market area. But outside that there are only some radial roads connecting various communes and the nearby state of Assam. There is large parcel of land occupied under the railway station. Commercial areas are mainly located in city centre Town and along the major transportation corridors. The area for Recreational Use is practically negligible, since there are few green spaces, parks and gardens. There is a portion of area under agricultural use as tea estate also. The existing land use area on new conurbation area is 47 sq.km.

11.6.3 RURAL AREA AND GROWTH CENTRES

The formation mainly happens when the CBD gets saturated with developmental activities and there is hardly any room for further development. Thus, it demonstrates the complex nature of urban areas. In the light of this, three growth centers and three growth points are identified in Dibrugarh Planning Area since there is a dire need to decentralize the commercial/public semi-public activities towards outskirts of the urban area. Three Growth centers are proposed in Lahowal, Chanmai Garia Gaon and Chengamari Gaon while the growth points are proposed in Dhekeri Gaon, Lekai Gaon, and Kapor Tepow Gaon.

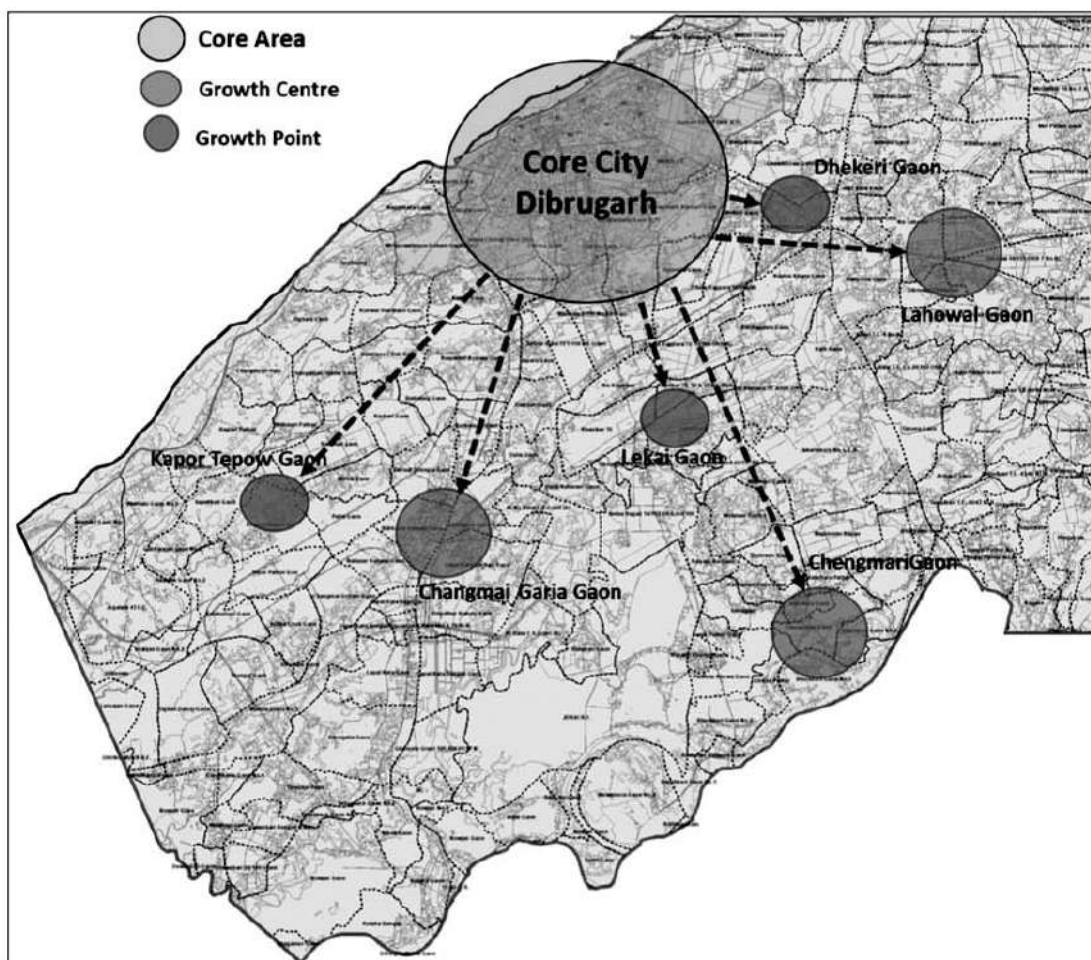


Figure 174 Concept Plan for Dibrugarh Planning Area 2045

The formation mainly happens when the CBD gets saturated with developmental activities and there is hardly any room for further development. Thus, it demonstrates the complex nature of urban areas. In the light of this, three growth centers and three growth points are identified in Dibrugarh Planning Area since there is a dire need to decentralize the commercial/public semi-public activities towards outskirts of the urban area. Three Growth centers are observed in Lahowal, Chengamari Gaon and Changmai Garia Gaon while the growth points are proposed in Dhekeri Gaon, Lekai Gaon and Kapor Tepow gaon.

11.6.3.1 Chengmari Growth Centre

Chengmari located in the Southern side of planning area is known as the rice bowl of the area and has very fertile chunks of agricultural land. Thus, protection of this prime agricultural land is necessary for preserving the dwindling numbers of agricultural land and to increase the employment opportunities in primary sector. Moreover, preserving the big chunk of agricultural land will enhance the overall environment of the DMPA. Thus, Chengmari and near by villages are proposed as an agricultural growth centre. Other reasons stating the potential of Bahour commune to be developed as a growth centre are mentioned below:

- Chengmari is 3 km from Joikai reserve forest and recreational area are existing at reserve forest like botanical garden and well-developed tea estates. These villages are situated along the Dihing river, hence there is huge scope for river front development for tourism and recreational are for upcoming settlements.
- Since Chengmari and villages have very fertile agricultural land, to support the agricultural activity like Tea gardens and paddy fields, special permission will given in the agricultural zone of Chengmari region, where the Godowns, Agricultural tool and equipment repairing, Cold Storage and allied activities etc. are allowed. Hence, commercial zone is proposed along the stretch of NH 45 A falling under Bahour Commune.
- Chengmari is situated 14 Km from Dibrugarh town via road, this road has ribbon development and potential to develop.
- Since the DMPA is Non-contiguous area, it is essential to focus on Chengmari centre as self-sustainable development to the extent which will reduce the generation of trips from Chengmari to Dibrugarh every day.
- Moreover, the proposed educational institutions in Lekai gaon and proposed Special tourism zone near Jokai R.F village will accelerate the scope of Chengmari to function self-sufficiently.
- The proposal of adventure sports facilities on Burhi Dihing river and amusement park at Muwamora Gaon will Pull the population from the nearby region which will further strengthen the development.
- Tea garden belt in villages of Bortomoto Bagan, Majutomoto Bagan and Kachamari Deori will act as green zone for Chengmari Growth Centre.
- Chengmari will have the impact of proposed outer ring road and Trans Arunachal Highway.

11.6.3.2 Chagmai Garia Gaon Growth Centre

- Chagmai Garia is situated around 12 km from Dibrugarh town via NH 37 and closer to Lapatkata Bengali gaon town where BCPL Industries are functional.
- Development of Chagmai Garia as Multi Nuclei / Self sustainable center may reduce the traffic flow to Dibrugarh town.
- The presence of already existing industries will attract a greater number of industries. Tool based industries are proposed to be strengthened by capacity building programs.
- Apart from this, Chagmai Garia is also proposed as a Multimodal Transit Hub which will attract and boost the development in the surrounding area. People travelling from Sivasagar and North Lakhimpur to Dibrugarh can interchange the mode of transport from Chagmai Garia.

- Existing Railway line is also passing from the West-Northern side of the Chagmai Garia. The Growth centre can take an advantage of this connectivity as well. The existing Dhamal Gaon Railway station over this route will be an important mode of regional transport between Chagmai Garia and Dibrugarh. Due to this connectivity, the Growth centre will be further flourished in terms of development.

11.6.3.3 Lahowal Growth Centre

Lahowal (Vidhan Sabha constituency) is one of the 126 assembly constituencies of Assam Legislative Assembly. Lahowal forms part of the Dibrugarh Lok Sabha constituency. Lahowal is connected with railway and have its own railway station. Lahowal Collage is well known in the region established in 1994, it is accredited from NAAC and it is affiliated to Dibrugarh University. Collage offers 15 courses across 5 streams namely Vocational, IT, Arts, Education, Commerce and Banking. Hostel facility is not available for its students. Mohanbari Dibrugarh Airport is just 3 km away from Lahowal Railway station. Thus, it is proposed to be developed as a hub of Hotel and Service industry to promote the agricultural activities like tea farming and tourism to enjoy aesthetics of tea and golf courses. Sufficient commercial areas are proposed to facilitate agricultural allied activities. Other reasons stating the potential of Nettapakkam commune to be developed as a growth center are mentioned below:

- Majority of the area in this commune falls under agriculture category and the residents are dependent on primary sector for economy generation.
- In consideration of this aspect, Nettapakkam has been proposed as agricultural Growth Centre where agriculture and its allied activities will be promoted.
- The connectivity with NH-37, SH-23, Railway and Airport will accelerate the scope of development for this area.
- Eco village tourism is proposed here as the existing character of the area has the potential to be developed as an Eco village tourism. Moreover, this will act as a livelihood option for the residents of the area.

11.6.4 GROWTH CENTRES

The selected points will produce self-sustaining growth. In Dibrugarh Planning Area, three growth points have been identified viz. Lekai, Kapor Tepow, and Dhekeri Goan.

11.6.4.1 Lekai Growth point

Lekai Growth Point which is located on the southern side of the planning area, has the close proximity to Dibrugarh Bypass. It's close proximity to the proposed special tourism zone enables this area with great potential to grow as a growth point attracting investments and being a node for services for the surrounding areas.

11.7 RATIONAL FOR THE CONTIGUOUS URBAN DEVELOPABLE AREA

In addition to the regional connectivity of the DMPA with the rest of the seven sister states and the country, existing settlement pattern and urban growth in and around the Dibrugarh city, location of eco-sensitive areas and existing land use have to be taken into consideration while developing concept plan for the proposed DMPA.

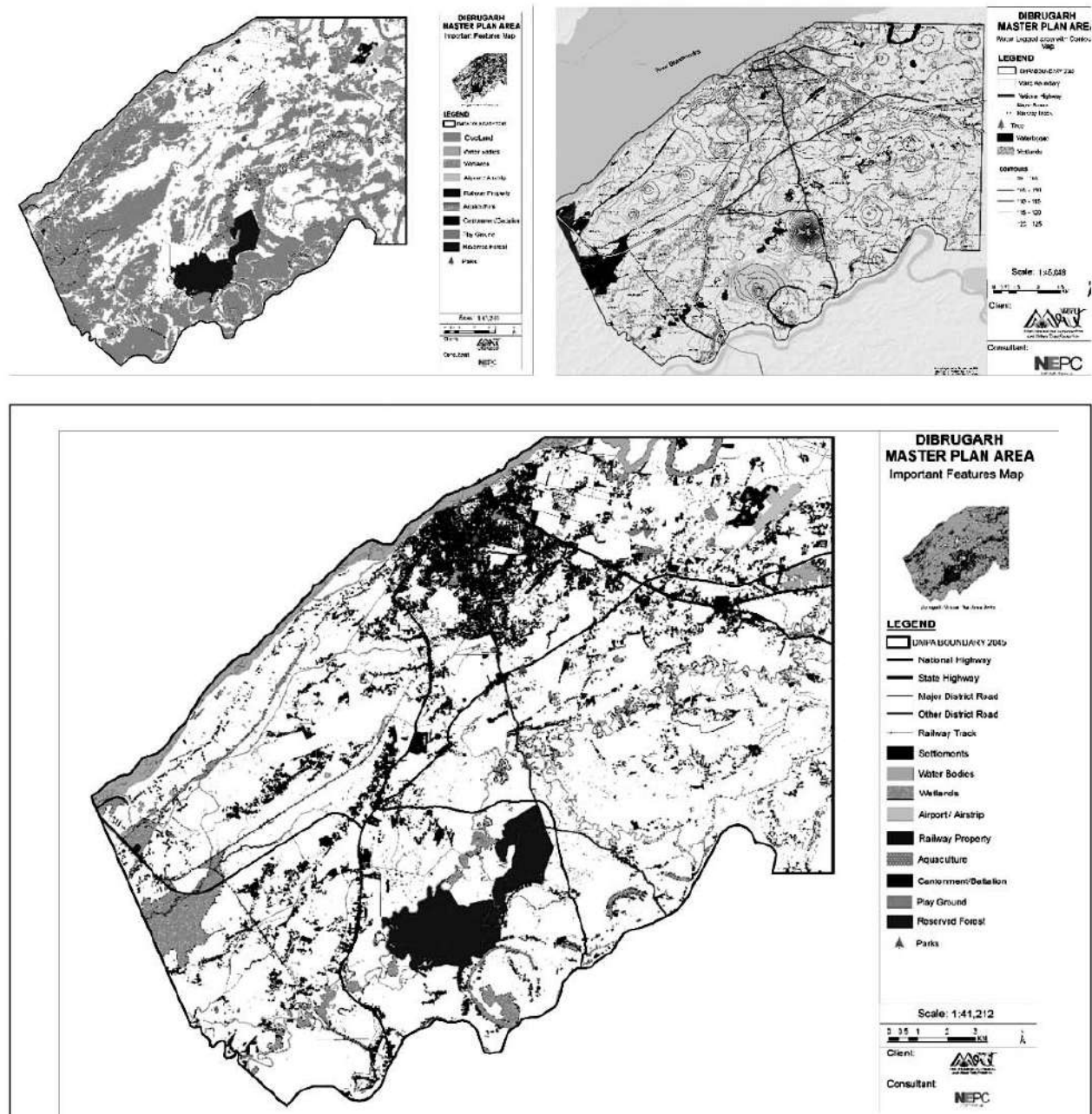


Figure 175 Physiography and Settlements within DMPA

11.7.1 TRANSPORTATION AXIS AND GROWTH PATTERN

Strategic location of the Dibrugarh city makes it the regional center of the Upper Assam region. Number of nation highways that are spread across the Assam State; connect Dibrugarh with the other states of northeast, as well as to the remaining India. In fact, over the last two decades, visibly urban growth has been observed along the transport axis. In addition, location of the airport and the railway stations have influenced the growth pattern of the region. Hence, road network, rail network and location of airport is taken in the consideration while developing the alternatives for the Contiguous Urban Developable Area.

Road connectivity has enhanced the urban development of DMB and its surrounding areas. There has been visible growth observed in the East-West direction along the NH-37, towards south along Mancotta Road, in the south-west towards Sivasagar along NH-37 and towards Lahowal to some extent. Numbers of new urban centers have gradually emerged along these transportation corridors. In fact, number of urban areas has increased to 4 in 2011 (including Mohpowalimora outgrowth). The maximum growth in the urban centers has been observed in the areas situated on the south of the existing boundary of DMB area, especially in Niz Mankatta and Chiring gaon, along the Mancotta road.

In addition, the functional interdependency of the first order and second order urban settlements on the Dibrugarh city is also taken in the consideration, while developing the alternatives for the proposed Contiguous Urban Developable Area.

11.7.2 ECO-SENSITIVE AREA AND EXISTING LAND USE:

Other than the urban centres, pattern of the rural settlements in the region is also taken in the consideration, along with the existing economic nodes and eco-sensitive areas. Eco sensitive area, such as forest, wetlands, and waterbodies have also taken in the consideration while developing the alternatives for the Contiguous Urban Developable Area. In the context of Dibrugarh whole river tributary system of Brahmaputra and reserve forest need to be taken care of. Those areas are restricted, and eco-friendly zones and land uses are proposed accordingly.



11.8 ALTERNATIVES FOR CONTIGUOUS URBAN DEVELOPABLE AREA

Overlaying the existing development pattern with the transportation axis, layer of eco-sensitive areas, and with the existing land use pattern in the region, following options were worked out. Here, presented all the alternatives were discussed with the Govt. officials. Recommendations and objections suggested by the authority have later incorporated in the final concept plan, presented at the end of this chapter. In addition, four gross density alternatives were also developed to exercise the proposed urban developable area. As per URDPFI guidelines, ideal density for urban developable area in plain region should be 100-150 pph (person per hectare). Considering this guidelines, the urban developable area should be comprised around between 60 sq.km to 80 sq.km. Below explained the possibilities for Contiguous Urban Developable Area, which comprises area between 60 to 70 sq.km. All presented alternatives were discussed with the authority, and the alternative-1 was finalized after weighting pros and cons of each of them.

Table 240 Considered Gross Density for Developable Area

2045 Population	5,51,757
Alternative-1: 90 pph Density	
Req. Area (sq.km)	61.31
Alternative-2: 100 pph Density	
Req. Area (sq.km)	55.17
Alternative-3: 125 pph Density	
Req. Area (sq.km)	44.14
Alternative-4: 150 pph Density	
Req. Area (sq.km)	36.78
DMPA Area (sq.km)	391
Gross Density (pph)	14.14
UDPFI Guideline Recommended Density	100-150

11.9 GUIDELINES AND CRITERIA CONSIDERATION

All the above considerations would ensure in the future DMPA a planned spatial structure of the urban settlements and their functional interdependency with each other. Proper zonation and prioritizing the fragile ecology area with least development activities in terms of extensive usage of land including recreational and low-density zone would ensure a balance between developable and open spaces. The transportation axis in the area is also a major consideration, which will help facilitate the region in improving inter and intra connectivity. The final concept plan for the urbanization area of the DMPA hereby have been conceptualized with the approach that other towns around DMB would be developed as Growth Centre and Growth Point within the DMPA. After the discussion with the authority, 391 sq.km of the proposed DMPA with 322.13 sq.km of the contiguous urban developable area has been selected. Out of total DMPA area, 322.13 sq.km area is the Contiguous Urban Developable Area, which is around 82.40% of the total DMPA area. Out of total Urban Developable Area, 39.11% area is non-developable area that comprise tea estates, waterbodies, nallas, forest, and defense land; while rest of the 60.89% area is available for urban development.

Table 241 Existing Landuse Distribution

Sr. No.	Landuse Type	Area (Sq Km)	Percentage of Developed Area (%)	Percentage of Planning Area (%)
1	Residential	45.96	66.73	11.75
2	Commercial	1.19	1.73	0.30
3	Industrial	4.95	7.19	1.27
4	Mixed	0.30	0.44	0.08
5	Public and Semi Public	5.58	8.10	1.43
6	Public Utilities	0.195	0.28	0.05
7	Recreational	1.71	2.48	0.44
8	Transportation	8.98	13.04	2.30
Total (Developed Land)		68.87	100	17.61
9	Vacant	31.42		8.04
10	Agricultural	143.35		36.66
11	Tea Estates	86.72		22.18
12	Forest	23.08		5.90
13	Tree Clad	2.52		0.64
14	Waterbody	21.24		5.43
15	Wetlands	13.75		3.52
16	Eco Sensitive Areas	0.06		0.02
Total (Undeveloped Land)		322.13		82.40
Grand Total		391.00		100

Out of total DMPA area, 322.13 sq.km area is the Contiguous Urban Developable Area, which is around 82.40% of the total DMPA area. Out of total Urban Developable Area, 39.11% area is non-developable area that comprise tea estates, waterbodies, nallas, forest, and defence land; while rest of the 60.89% area is available for urban development.

11.9.1 CRITERIA TAKEN IN CONSIDERATION FOR PROPOSED LAND USE DISTRIBUTION

URDPFI guidelines for the land use distribution (within urban developable area) are taken in consideration for the land use distributions in the DMPA. Apart from the URDPFI guidelines, residential area requirement for housing provision based on the 1.2 FSI (Floor Space Index) and commercial and industrial area requirement based on the employment projection are also taken into the considerations.

11.9.2 GUIDELINES FOR LAND USE DISTRIBUTION

Following table presented the recommendation for land use distribution within the urban developable area by URDPFI Guidelines. The table also show the proposed land use distribution within the proposed urban developable area.

Table 242 Guidelines for Land Use Distribution

Land use Categories	Recommendation as per URDPFI Guidelines (in percentage)
Residential	43-48
Commercial / Mixed Use	4-6
Manufacturing/ Industries	7-9
Public and Semi-Public	6-8
Open Space Zone/ Recreation	12-14
Transportation & Communications	10-12
Agriculture, Water Bodies and Special Areas	Balanced
Total	100

11.9.2.1 Residential Area Requirement Based on Housing Demand

As per the housing projection (refer chapter-6), the DMPA would be required total 74,070 housing by 2045. Based on the consideration of 200 sq.mt/housing unit and 1.5 FSI (Floor Space Index), with 25% circulations, and 50% ground coverage, around 18.57 sq.km of residential land is required to accommodate the 74.07 thousand houses within the urban developable area of the proposed DMPA. Overall, minimum 64.47 sq.km of land will be required for residential settlement in the Planning Area 2045.

Table 243 Residential Area Requirement Based on Housing Demand

Criteria	Year 2045
Total No. of Houses Required	74,070
Area Per Housing Unit (sq. meter)	200
Total Residential Unit Area (on sq. meter)	14814000
Assumed Additional 25% Circulation Area Required per unit	
Total Gross Area (Total Residential Plot/Area) (sq.mt)	18517500
Allowed FSI / Average FSI as per GDCR	1.5
Net Area Residential Requirement at Plot Level	12345000
Required Residential Area (sq.km)	12.34
Required Residential Area (ha)	1234
Assumed Allowed (as per GDCR) 50% is Ground Coverage for road and other circulation at city level	
Gross Residential Land Requirement (DMPA Level) (sq.mt)	18517500
Required Total Gross Residential Area in DMPA (sq.km)	18.51
Required Additional Residential Area (ha)	1851

11.9.3 CRITERIA TAKEN IN CONSIDERATION FOR LAND USE PROPOSALS

Based on the land suitability and potential analysis, existing land use pattern, and existing situation following criteria were considered while developing land use proposals for the DMPA, especially within the contiguous urban developable area:

- As the region is blessed with three rivers and eco-sensitive area, the area surrounding them should be kept conserve and no or low intensity development should be allowed. No-development buffer varying from 9 meter to 30 meter should be kept surrounding river and reserved forest.
- As far as possible low intensity of residential development should be considered in the area that is in the close proximity of the eco- sensitive areas.
- Based on the existing land use pattern, high intensity of mixed use development along the major roads should be considered.
- Transport zone or transport related activities should be kept nearby transport facilities such as Interstate Highway.
- Road network should be designed to have a proper road circulation throughout the Master Plan area, with road hierarchy to provide free movement and to reduce congestion from the existing roads.

11.10 PROPOSED LAND USE PLAN

The total project area includes DMB, Existing DDA Area and additional area added to make Dibrugarh Master Plan Area. Area other than settlements and developmental activities, such as open land (waste land, open / vacant land), wet lands (used for recreational development), Tree covers, Tea estates can be foreseen based on development potential, feasibility, suitability, and consultation with stakeholders.

11.10.1 PROPOSED LAND USE DISTRIBUTION

Based on the above mentioned all the criteria, below mentioned land use distribution has proposed. The proposed land use map allocate 49.49% for residential, 5.26% land for commercial and mixed use development, 8.71% land for industrial development, 9.10% for public and Semi Public, and 8.89% land for open space and recreational purposes out of total developable area. The Master Plan also conserves 38.61% area for the urban agriculture and tea cultivation within DMPA.

Table 244 Existing and Proposed Land Use Distribution of DMPA 2045

Sr. No.	Existing - 2020				Proposed - 2045		
	Landuse Category	Area (Sq Km)	% age of Developed Area	% age of Planning Area	Area (Sq Km)	% age of Developable Area	% age of Planning Area
1	Residential	45.96	66.73	11.75	88.95	49.49	22.75
2	Commercial	1.19	1.73	0.30	9.45	5.26	2.42
3	Industrial	4.95	7.19	1.27	17.36	9.66	4.44
4	Mixed	0.30	0.44	0.08	15.65	8.71	4.00
5	Public and Semi Public	5.58	8.10	1.43	16.35	9.10	4.18
6	Public Utilities	0.195	0.28	0.05	3.2	1.78	0.82
7	Recreational	1.71	2.48	0.44	15.98	8.89	4.09
8	Transportation	8.98	13.04	2.30	12.79	7.12	3.27
Total (Developed Land)		68.87	100	17.61	179.73	100	45.97
9	Vacant	31.42		8.04	0		0.00
10	Agricultural	143.35		36.66	66.15		16.92
11	Tea Estates	86.72		22.18	84.8		21.69
12	Forest	23.08		5.90	23.08		5.90
13	Tree Clad	2.52		0.64	2.52		0.64
14	Waterbody	21.24		5.43	21.24		5.43
15	Wetlands	13.75		3.52	13.75		3.52
16	Eco Sensitive Areas	0.06		0.02	0.06		0.02
Total (Undeveloped Land)		322.13		82.40	211.6		54.12
Grand Total		391.00		100	391.00		100

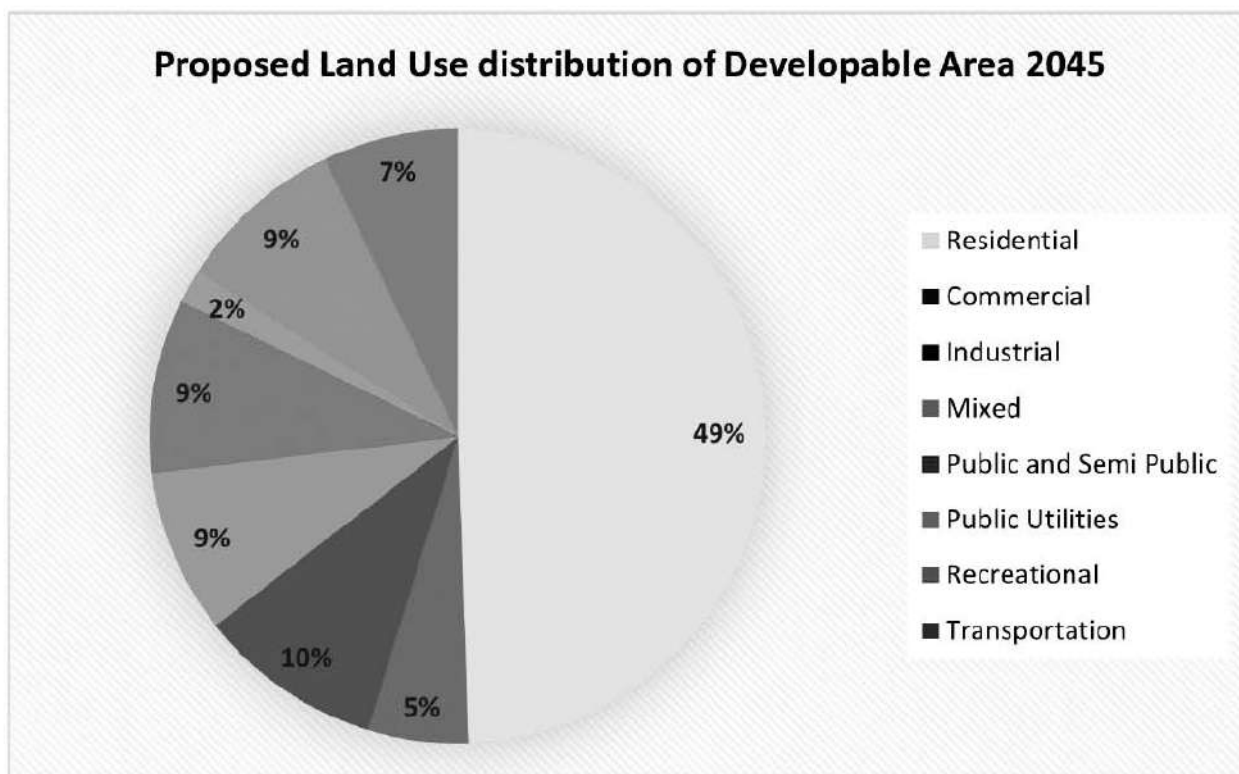


Figure 176 Dibrugarh Developed Planning Area Proposed Land Use Distribution

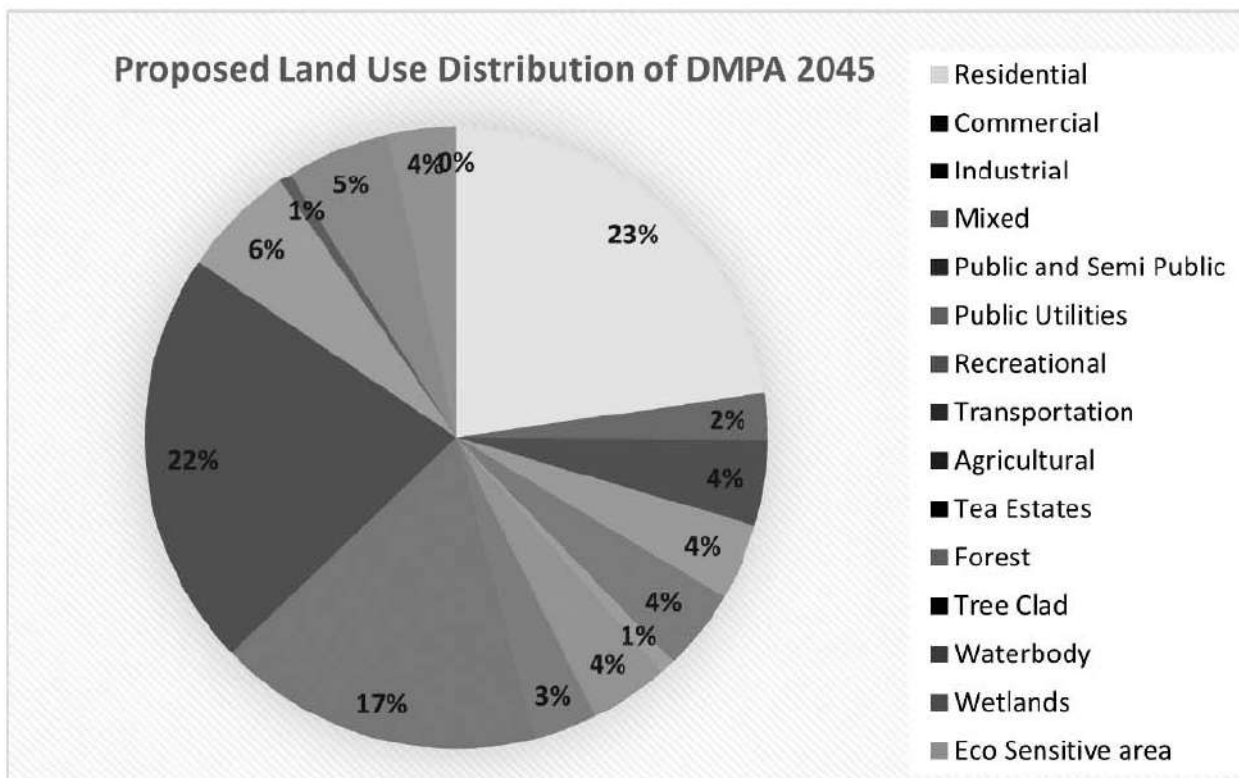


Figure 177 Total Dibrugarh Planning Area Proposed Land Use Distribution

11.10.1.1 Residential Use

For the projected residential population of 5,51,757 persons, the total area required by 2045 for urban development is forecasted to be 17973 hectares, out of which 8895 hectares (49.49% of the developable area) are earmarked for residential development against 4596 hectares available at present. The dedicated area for affordable housing for economical weaker sections is separately identified in the proposed land use plan 2045.

11.10.1.2 Commercial Use

Commercial use has been increased to 945 hectares for the projected year 2045 from the existing 173 hectares which contributes about 5.26 % and 2.42% of the developed area and the total planning area respectively. As the population increases the demand for commercial area increases, hence commercial areas has been planned at the major junction nodes.

11.10.1.3 Mixed Use

Mixed use has been increased to 1565 hectares for the projected year 2045 from the existing 30 hectares which contributes about 8.71 % and 4.00% of the developed area and the total planning area respectively. As the population increases the demand for mixed use area increases, hence mixed use areas has been planned along all the higher level roads.

11.10.1.4 Industrial Use

Industrial use has been increased to 1730 hectares for the projected year 2045 from the existing 495 hectares which contributes about 9.66 % and 4.44 % of the developed area and the total planning area respectively.

11.10.1.5 Public and Semi-Public Use

Public and Semi-Public Use has been increased to 1635 hectares for the projected year 2045 from the existing 558 hectares contributing about 9.10 % and 4.18 % of the developed area and the total planning area respectively.

11.10.1.6 Recreational Use

Recreational use has been increased to 1589 hectares for the projected year 2045 from the existing 171 hectares.

11.10.1.7 Transportation Use

Area under Transportation use has been increased to 1279 hectares for the projected year 2045 from the existing 898 hectares.

11.11 FACILITY CENTRE

Based on the hierarchy of order of settlements, facilities are planned. The following are the levels based on hierarchy:

- City level

To facilitate higher order planning, city level facilities are provided.

- Neighborhood/ Planning Unit

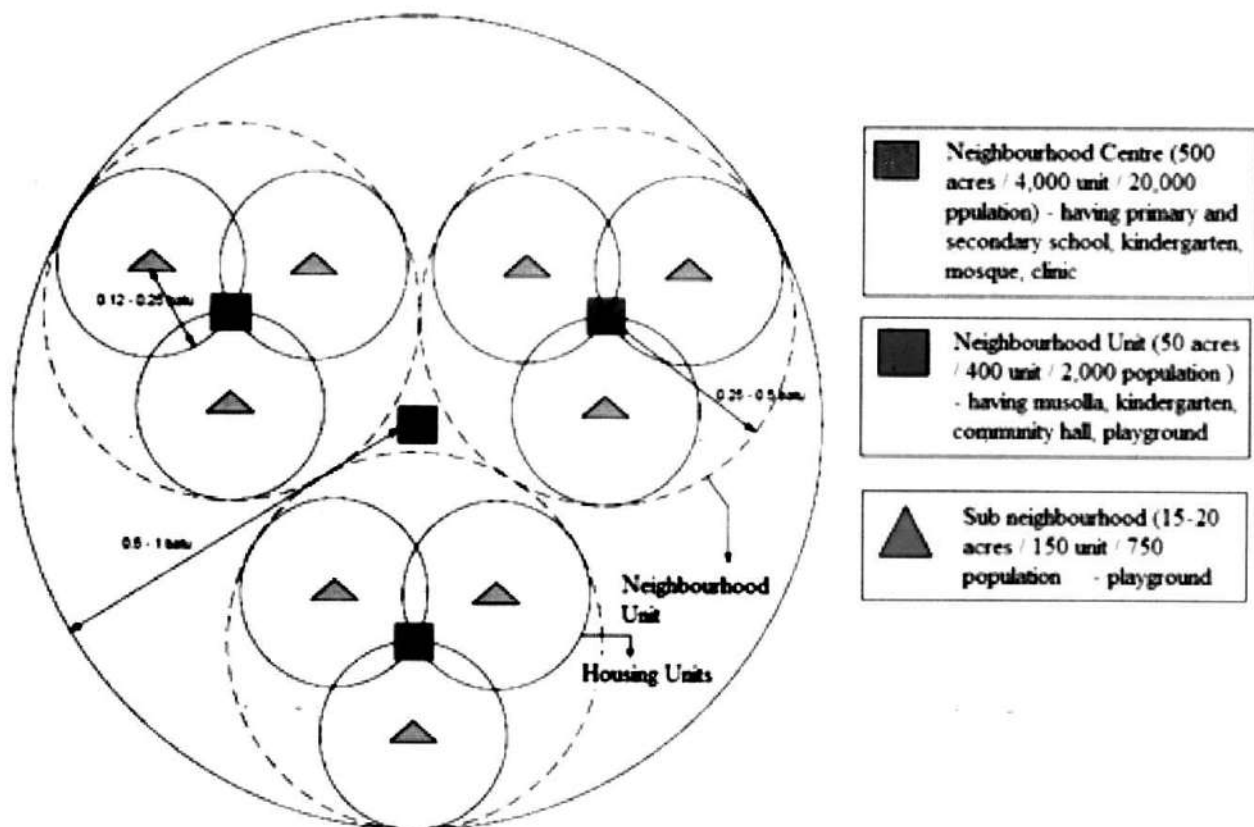
Neighborhood into 2 levels

Level I-- 10000-11999

Level II- 12000-15000

- Housing Area Level/neighborhood level

Grouped to form Housing Area with an average population of 5000 population.



Higher order facilities as general hospital, intermediate hospital, college, integrated schools, and school for handicapped, socio-cultural and recreational club, fire and police stations are provided at the master plan level. Nursery and primary schools, dispensaries are provided at the Neighborhood.

Table 245 Details of Neighbourhood Centres (10 Hectares for 10000 to 12,000 population)

Sr. No.	Facilities	No.	Area per Unit (ha)	Total Area (ha)
1	High Secondary School	1	1.6	1.6
2	Dispensary	1	0.1	0.1
3	Community Hall cum Library	1	0.2	0.2
4	Community Room	2	0.1	0.2
5	Primary School with Playfield	2	0.4	0.8
6	Middle School with play field	1	0.5	0.5
7	Electric Sub Station	1	0.05	0.05
8	Local shopping including Service Centre	1	0.45	0.45
9	Neighbourhood Park	1	0.75	0.75
10	Neighbourhood Play Area	1	0.75	0.75
11	Three wheeler cum Taxi Stand	1	0.05	0.05
12	Religious Building	1	0.05	0.05
Sub Total -A			100	5.5
13	Transportation and Communication			2.5
Grand Total				8.0

Table 246 Details of Neighbourhood Centres Provisions (10 Hectares for 12001 to 15,000 population)

Sr. No.	Facilities	No.	Area per Unit (ha)	Total Area (ha)
1	High Secondary School	1	1.6	1.6
2	Dispensary	1	0.1	0.1
3	Community Hall cum Library	1	0.2	0.2
4	Community Room	2	0.1	0.2
5	Primary School with Playfield	2	0.4	0.8
6	Middle School with play field	1	0.5	0.5
7	Electric Sub Station	1	0.05	0.05
8	Local shopping including Service Centre	1	0.45	0.45
9	Neighbourhood Park	1	0.75	0.75
10	Neighbourhood Play Area	1	0.75	0.75
11	Three wheeler cum Taxi Stand	1	0.05	0.05
12	Religious Building	1	0.05	0.05
Sub Total -A			100	5.50
13	Housing Area			2.00
Sub Total -B				7.50
14	Transportation and Communication			2.50
Grand Total				10.00

11.12 ZONING REGULATIONS

In order to promote public health, safety and the general social welfare of the community, it is necessary to apply reasonable limitation on the use of land and buildings. This is to ensure that the most appropriate economical and healthy development of the city takes place in accordance with the land use plan. For this purpose, the City is divided into a number of use zones, such as residential, commercial, industrial, public and semi-public, etc. Each zone has its own regulations as the same set of regulations cannot be applied to the entire town.

Zoning protects residential area from the harmful invasions of commercial and industrial uses and at the same time promotes the orderly development of industrial and commercial areas. By regulation the spacing of buildings, adequate light, air, protection from fire etc. can be provided. It prevents overcrowding in buildings and land thus ensures adequate facilities and services.

Zoning is not retrospective. It does not prohibit the uses of land and buildings that are lawfully established prior to the coming into effect of the zoning regulations. If these uses are contrary to the newly proposed uses, they are termed as non-conforming uses and are gradually eliminated over years without inflicting unreasonable hardship upon the property owners.

The zoning regulations and their enforcement are a major tool in keeping the land uses pattern of the Comprehensive Master Plan. It has been stated that the consultants have adopted the UDPFI guidelines with minor modification. However while detailing out the use permissibility, etc in various categories all care has been taken to integrate:

(A) The Assam Notified Urban Areas (Other than Guwahati) Building Rules, 2014;

(B) URDPFI Guidelines.

This formulated guideline may adopt other provision of the regulation towards intensity of development and built form guidelines, etc.

1. In the Dibrugarh Master Planning Area (DMPA), various use zones namely Residential, Commercial, Mixed Use, Industrial, Public and Semi- Public, Utilities and Services, Recreational, Transportation, Agricultural, Protective and Undevelopable Areas having their location as indicated in the Comprehensive Master Plan shall be regulated and guided. Except or otherwise provided, no structure or land here inafter shall be erected, recreated or altered unless its use is in conformity with the following regulations.
2. All existing places of worship, temples, churches, mosques, burial and cremation ground etc. shall be exempted from being treated as nonconforming uses, provided that continuance of such uses are not detrimental to the locality as decided by the Authority from time to time.
3. All non-conforming uses of land and buildings shall be discontinued by the owner and the modified uses shall be made to conform to the land use of the development plan in force within six months of the Regulations coming in force.

11.12.1 RESIDENTIAL ZONE (R)

Residential Zone is pure residential area in which major commercial and industrial activities are not allowed, however some for day-to-day needs of shopping uses should be allowed. In addition, a comprehensive range of community facilities, including schools, medical facilities, neighborhood retail and open space are allowed. Total 88.95 sq.km (49.49%) of area is earmarked for Residential Zone in the proposed land use plan. Further, the zone is classified into three categories viz. Residential Zone-1, Residential Zone-2, and Residential Zone-3. Refer the GDCR (General Development Control Regulations) for allowed activities and permissible floor space for each activity, in all zones.

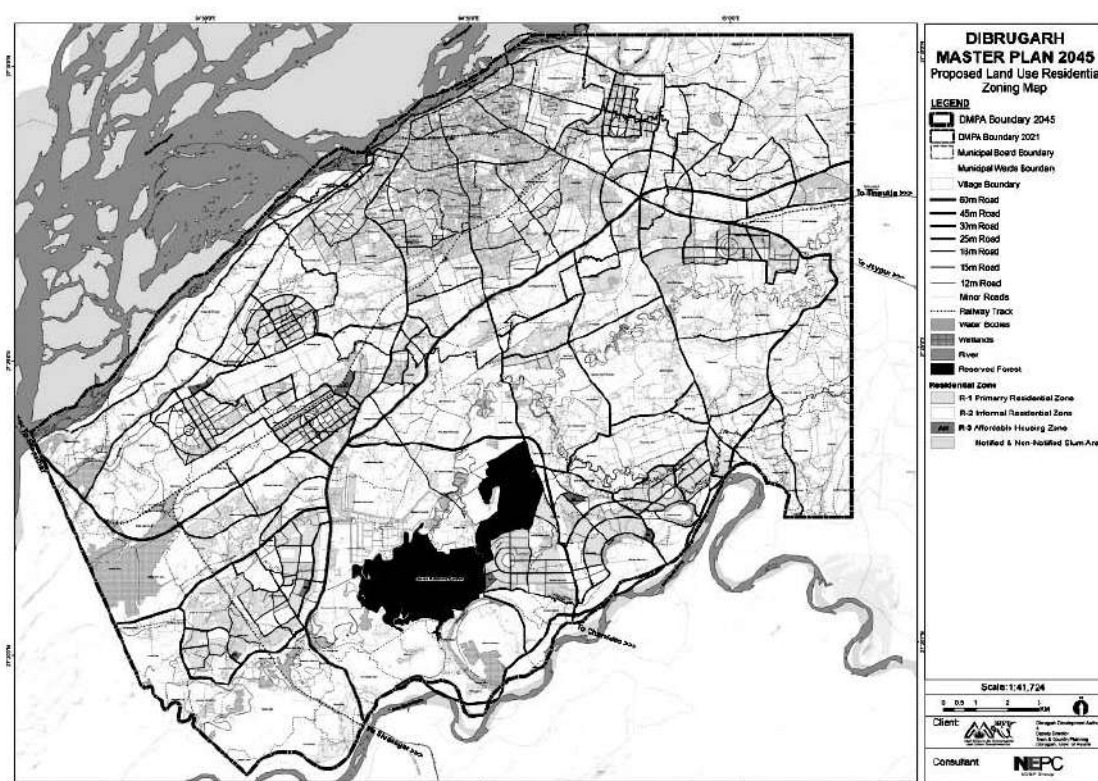


Figure 178 Proposed Residential Zone Map, DMP 2045

As conurbation area will be facing the higher pressure of development, ample residential area is proposed in order to accommodate the future expansion which will take place in the future.

11.12.1.1 Primary Residential Zone-1 (R1)

Total 67.41 (17.24%) sq.km of land is allocated for R1 zoning. Higher intensity residential development is allowed in this zone. No other than residential uses are allowed in this zone; however, housing will be developed with a comprehensive range of community facilities, including schools, medical facilities, neighborhood retail and open space.

11.12.1.2 Unplanned Residential Zone-2 (R2)

The residential area that is proposed outside the proposed Contiguous Urban Developable Area are earmarked as a Residential Zone-2. Medium to low intensity residential development is allowed in this zone. Total 20.6 (5.27%) sq.km of area is earmarked as R2 zone.

11.12.1.3 Residential Affordable Housing Zone-3 (R3)

This zone is an overlay Zone that permits predominantly residential development for providing Affordable Housing along with ancillary commercial uses Affordable Housing as a use is permitted in all zones except all types of industrial Zones, Restricted Zone, Residential 3 and agriculture Zone. It shall also be permitted as a use in all other categories. Affordable Housing is predominantly Residential development for providing Affordable Housing of dwelling units up to 80 sq.mts along with ancillary commercial use up to 10% of the total utilized FSI. Projects under Residential Affordable Housing (R3) shall utilize a minimum FSI of 1.8 and maximum 2.7 to avail the benefits of "RAH". Total 0.94 (0.24%) sq.km of area is earmarked as R3 zone.

11.12.2 COMMERCIAL ZONE (C)

Total 9.41 (5.26%) sq.km of area has earmarked in the proposed land use plan as Commercial Zone for commercial land uses. This zone allows a range of commercial uses including retail shops, offices, small-scale warehouses, and the hospitality industry that includes hotels and entertainment venues.

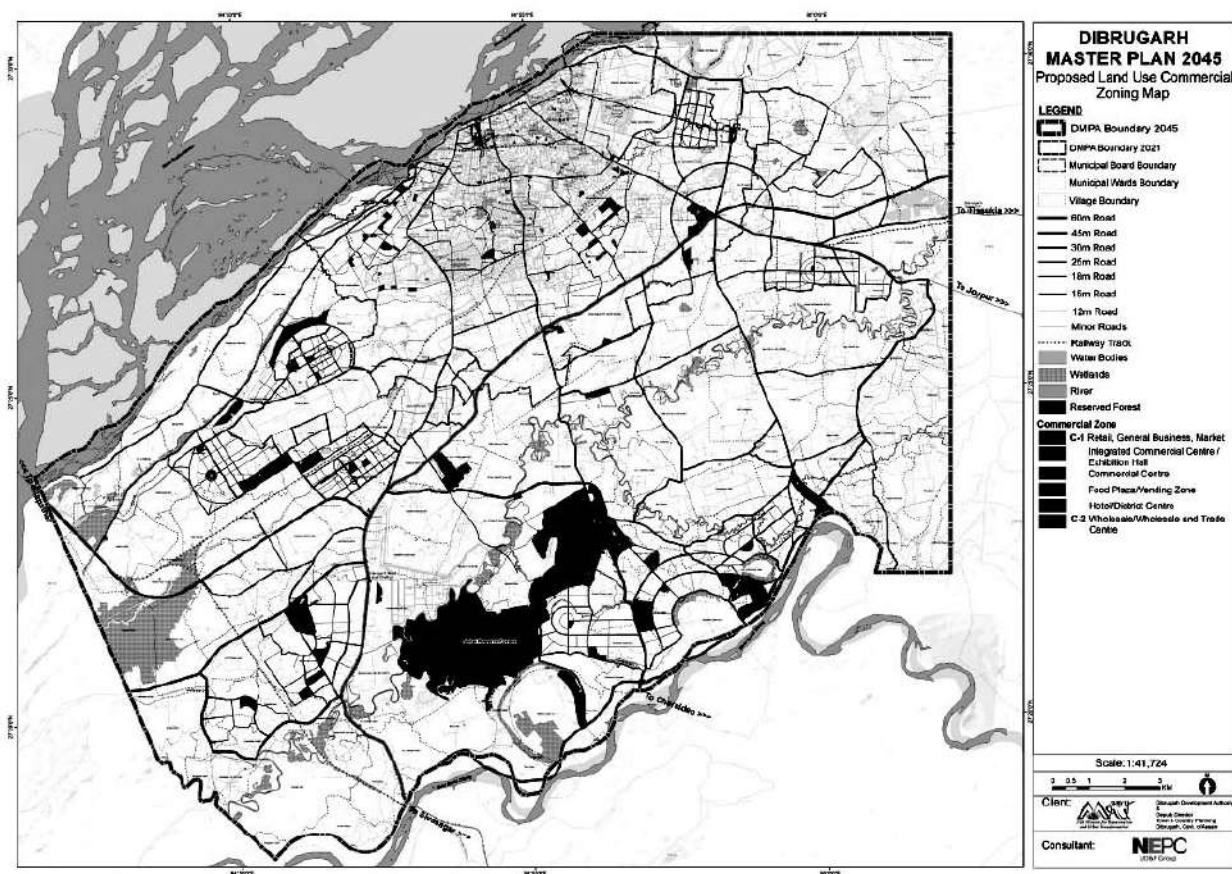


Figure 179 Proposed Commercial Zone Map, DMP 2045

Further, the zone is classified in two categories viz. Commercial-1 and Commercial-2.

C1: Retail Shopping Zone, General Business and Commercial District/ Centres, Regulated markets, Service Sector, Regulated/ Informal/ Weekly markets

C2: Wholesale, Go-downs, Warehousing

Existing industrial activities will be allowed to continue as non-confirming use but no new industrial related activities would be allowed in the earmarked commercial zone. Refer the GDCR (General Development Control Regulations) for allowed activities and permissible floor space for each activity, in all zones.

Retail Space:

- Neighborhood and Community Level Retail Space- will be located near residential area that will include kiosks, shops, and community markets; where day-to-day needs of consumers, particularly food shopping and convenience goods will be accommodated.
- District and City Level- Larger commercial center and intermediate commercial centres, which includes the prime retail space represented by malls and high quality shopping space.

Office Space:

Offices space will be required primarily for the indirect employment generated because of direct employment in the base industries and economic sectors. The following sectors will require office space:

- Transport and Storage
- Construction and Infrastructure
- Public Administration
- Utility Companies and Institutional bodies
- Banking and financial services
- IT based company and tele communication

It is assumed that the wholesale, retail sectors, banking and financial sectors will operate out of their own premises.

11.12.3 MIXED USE ZONE (MU)

Total 15.65(8.71%) sq.km area is earmarked as Mixed Use Land Use in the PLU. Further, this land use is classified into two zones viz Mixed Use-1 and Mixed Use-2.

11.12.3.1 Mixed Use-1 (MU-1)

Total 6.07 sq.km of area is proposed under this land use zone. Part of it is located along the part of NH 37 that is passing from South Gemmon Bridge on Burhi Dihing to the North of DMP area. 100 meter of influence area on both sides (Except Tea Estates) of the highway is proposed as a Mixed Use -1 zone.

Another earmarked 100 meter influence area on both side of NH-37 (from Hatkota Tiniali at Dainijan village to Amolapatty Chariali) and NH-37 (Chalkhuwa to Lahowal) is also proposed as a Mixed Use-1 zone. In the proposed Mixed Use-1 zone 80% of the FSI will be available for commercial/institutional/ PSP purposes, while the rest of the 20% FSI will be for residential purpose. Existing industrial allowed as non-confirming use but no new industrial activities will be permitted Refer the GDCR (General Development Control Regulations) for allowed activities and permissible floor space for each activity.

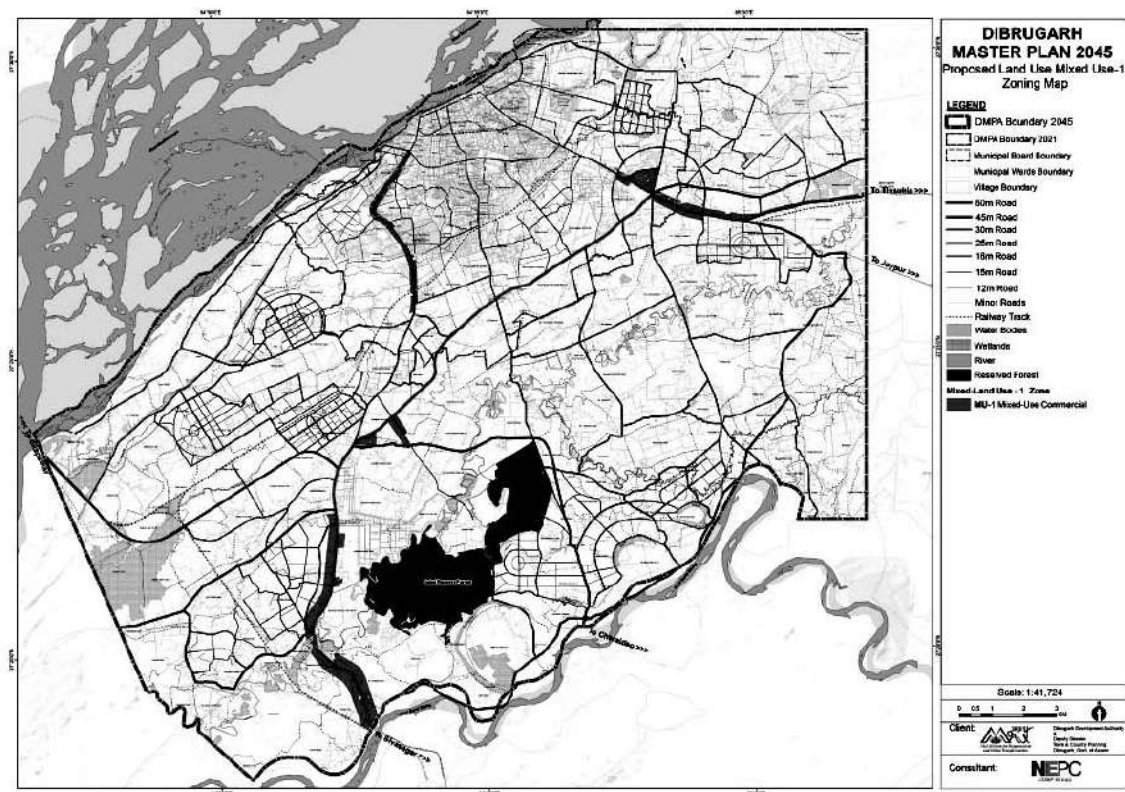


Figure 180 Proposed Mixed Use-1 Zone Map, DMP 2045

11.12.3.2 Mixed Use-2 (MU 2)

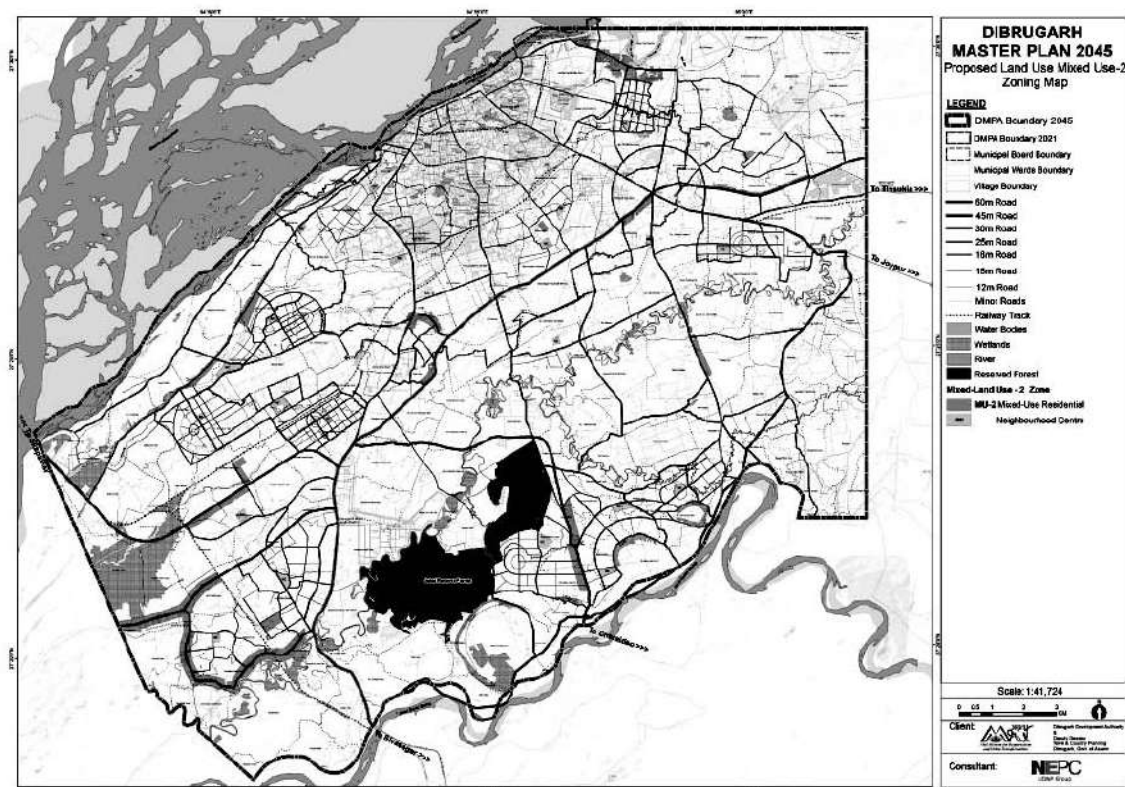


Figure 181 Proposed Mixed Land Use-2 Zone Map, DMP 2045

Total 16.35 sq.km of area is earmarked as a Public and Semi-Public zone in the proposed land use map. Health, Educational, Cultural, Government Buildings, sports and open space facilities will be allowed in this zone. Refer the GDCR (General Development Control Regulations) for permissible activities and permissible floor space for each activity.

11.12.5 INDUSTRIAL ZONE (I)

To create a conducive environment for development, Industrial Zone is created. Total 17.36 sq.km of the Industrial land use zone has demarcated in the proposed land use plan.

The Industrial zone is further classified in two categories viz. I-1, and I-2.

I-1: Service, Manufacturing and Light Industry

I-2: Extensive and Heavy Industry

The distribution of the main industrial zones is shown in the map. Only industrial activities are allowed in the demarcated industrial land use in the PLU map. In addition, small workshops and businesses can be allowed on the edge of the main industrial. However, existing land uses within the proposed industrial zone will allow as non-confirming use until redevelopment of such land parcels. Refer the GDCR (General Development Control Regulations) for permissible activities and permissible floor space for each activity.

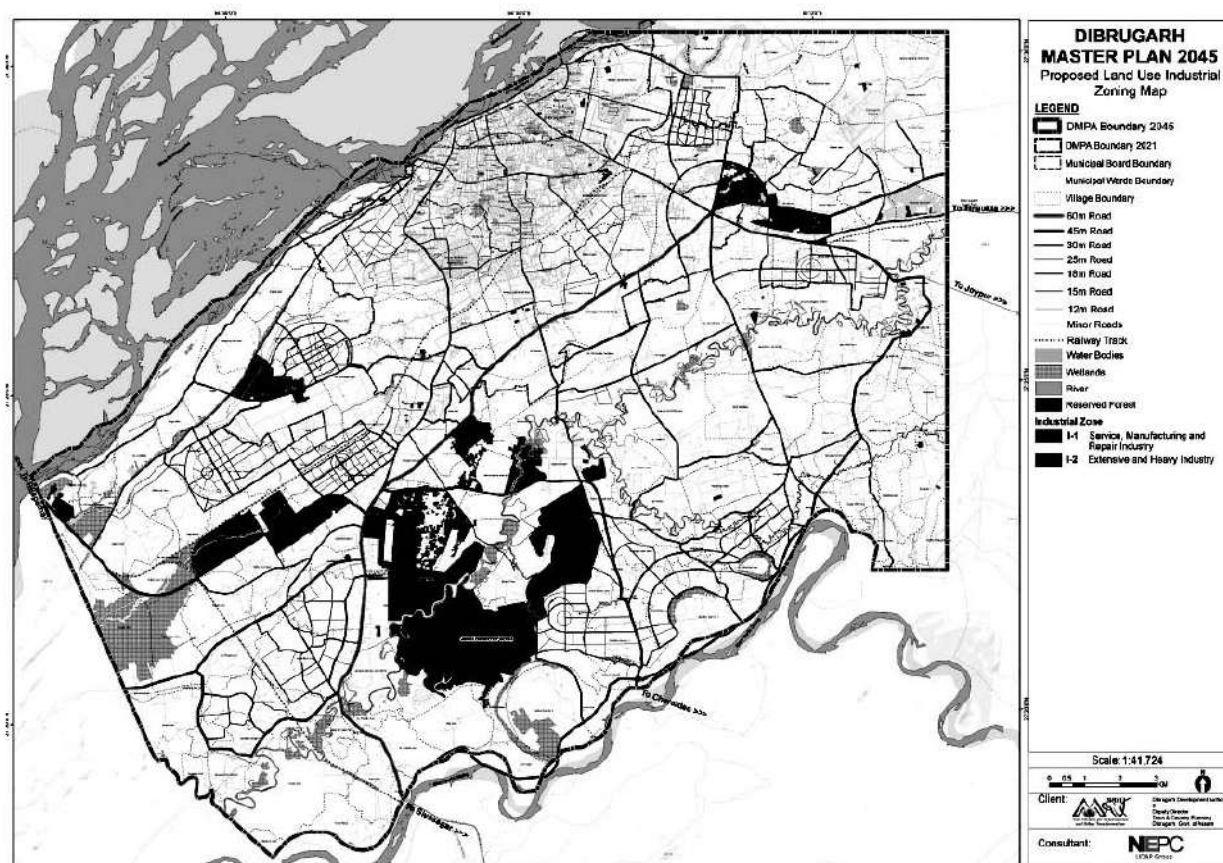


Figure 183 Proposed Industrial Zone Map, DMP 2045

11.12.6 OPEN SPACE AND RECREATIONAL LAND USE (P)

In order to ensure that the city is an attractive and desirable place to live, a high proportion of the developable area is proposed for open spaces and recreational activities.

The Recreational zone is further classified in three categories viz. P-1, P-2 and P-3.

P-1: Play Ground, Stadium, Sport Complex, District Sport Centre and District Multipurpose Ground

P-2: Zoo, District Park, Neighbourhood Park, Community Garden, Organised Open Space, Hotel, Resort and Spiritual Park.

P-3: Science City, Theme Park

The major green areas are proposed surrounding the waterbodies like Kachmari Bill, Bar Bill, Kath Bill, Gargari Bill and Wetlands. Around Sessa river and Ghogra Jan, buffer of 50 m and 20 m is given respectively. In Khanikar area, a District Sports Centre, Science City, Sport Complex, Stadium, District Park and District Multipurpose Ground have been proposed. In the neighbourhood level, recreational areas are proposed. Space for Zoo is identified near Jokai Reserve Forest. Amusement Park cum Theme Park is proposed at Mohmari Gaon.

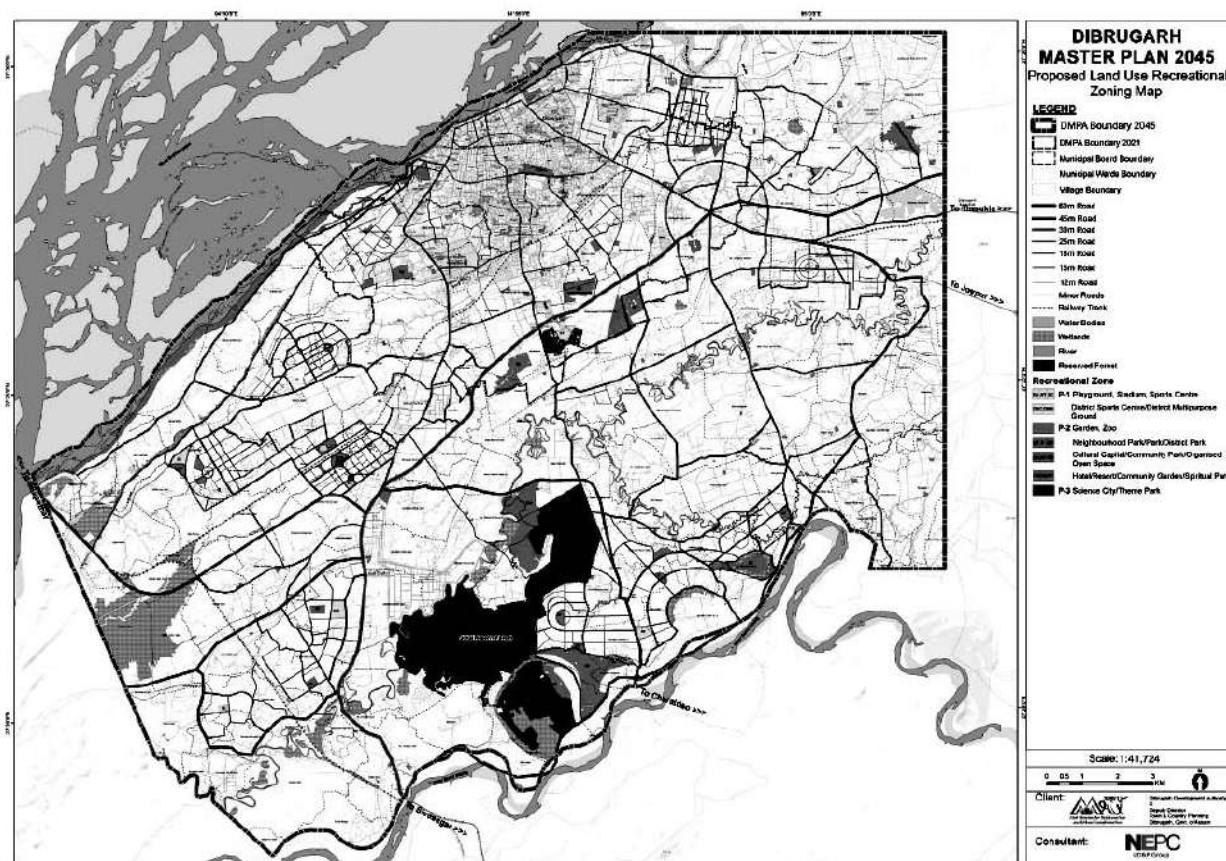


Figure 184 Proposed Recreational Zone Map, DMP 2045

Total 15.98 sq.km of area earmarked as Open Space and Recreational Land Use, where recreational activities, parks, riverfront development, playground, theme parks, and exhibition grounds can be allowed. Refer the GDCR (General Development Control Regulations) for permissible activities and permissible floor space for each activity.

11.12.7 URBAN AGRICULTURE ZONE (A)

With the rapid growth and expansion of cities, agricultural lands starts declining. Thus, this issue is meticulously dealt with, by providing dedicated agricultural lands in the planning area. The agricultural lands are protected till possible extent. Except conurbation area, in rest of the area agricultural land are proposed to be preserved. Moreover, every large chunks of Tea garden lands have been kept intact in different village.

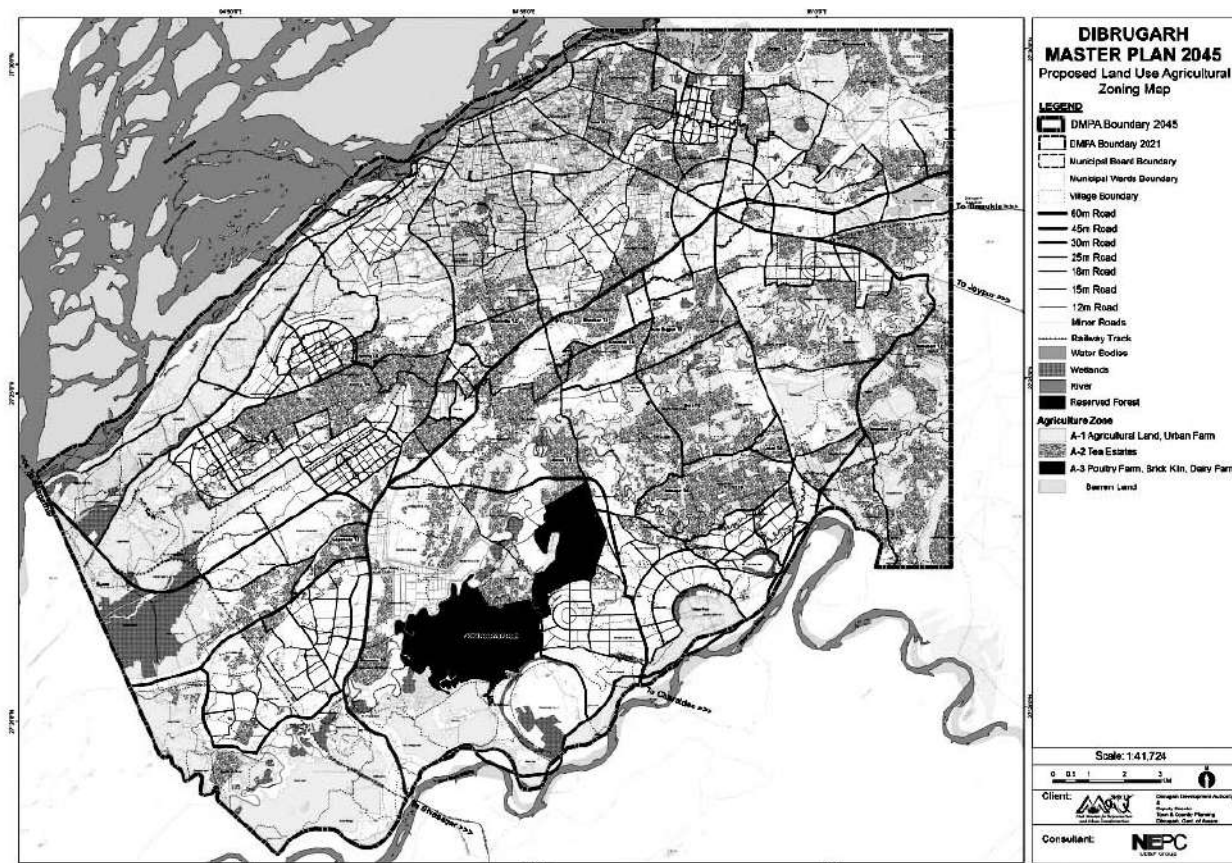


Figure 185 Proposed Agriculture Zone Map, DMP 2045

Total 150.95 sq.km of area earmarked as Urban Agriculture¹⁰ Zone, around the identified 'Contiguous Urban developable Area' in the proposed Land Use Plan. Urban agriculture land use is divided into three parts,

A-1: Agriculture Land, Urban farm

A-2: Tea Estates

A-3: Poultry Farm, Brick Kiln, Dairy Farm and Barren Land

Activities such as animal husbandry, aquaculture, agro-forestry, and horticulture will be allowed in this land use area. Refer the GDCR (General Development Control Regulations) for permissible activities and permissible floor space for each activity.

¹⁰ United Nations Development Program (1996) defines urban agriculture as an activity that produces, processes and markets food and other products, on land and water in urban and peri-urban areas, applying intensive production methods and reusing natural resources and urban wastes to yield a diversity of crops and livestock. Urban agriculture in addition can also involve animals.

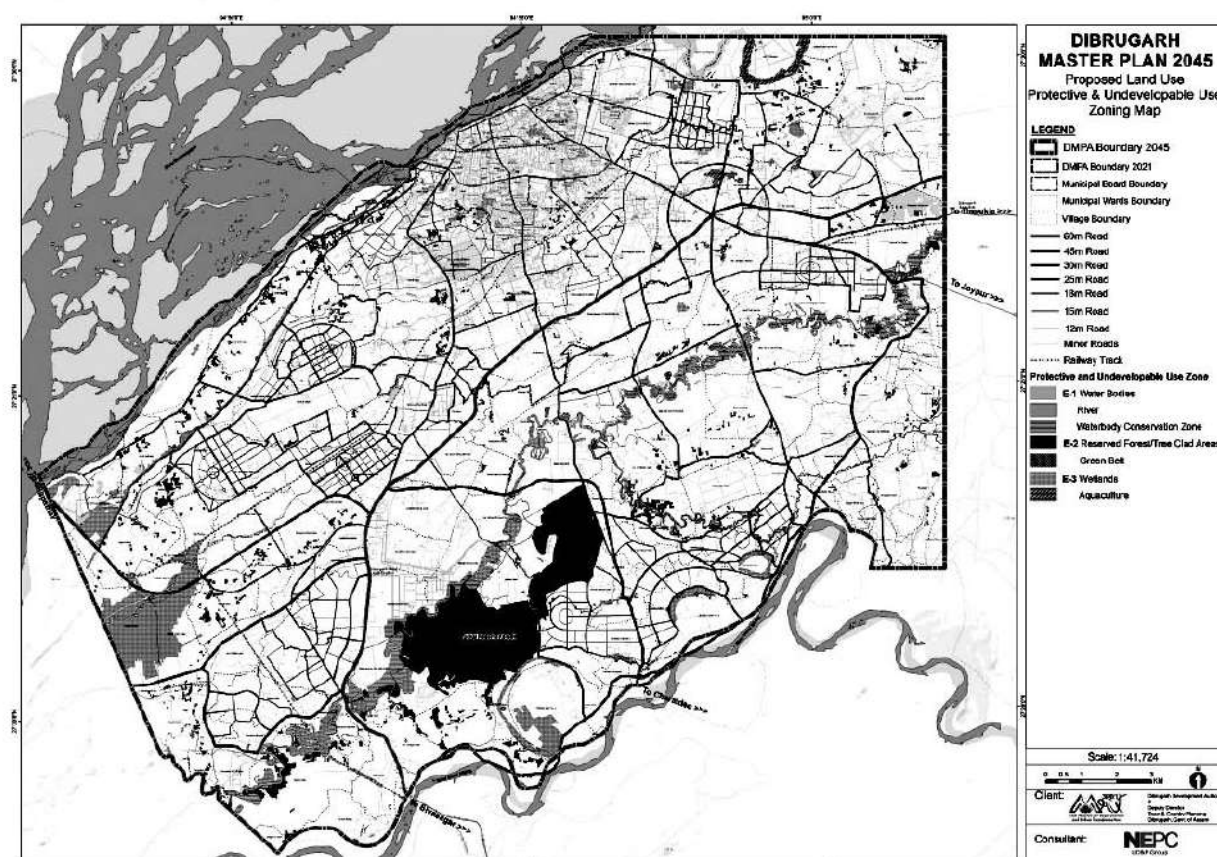
11.12.8 PROTECTIVE AND UNDEVELOPABLE USE ZONE (E)

Protective and Undevelopable Use Zone integrates all existing Waterbodies (i.e. rivers, streams, lakes, fisheries, natural drains and wetlands, as indicated in the topographical sheets published by the Survey of India, the State Irrigation Department or Revenue Department or other competent Authorities), Reserved Forest and Tree Clad Areas. The boundary of the waterbodies relate to the full tank level as indicated in relevant maps, covering both perennial and non-perennial parts when such distinction exists. As per the MoEF Guidelines, no development buffer is given surrounding the waterbodies. Depending of the size of the waterbodies, the buffer width varies between 9 to 30 meter. The 30-meter buffer is given to the larger waterbodies, such as rivers, lake, wetlands, while minimum of 9-meter buffer is kept around small waterbodies, such as nallas, streams, small water ponds, etc. There are around 34.87 sq.km of land is covered with Protective and Undevelopable Use Zone in the Planning Area.

Protective and Undevelopable Use Zone is divided into three parts,

E-1: Water Bodies and River, **E-2:** Reserved Forest, Tree Clad and Green Belt, **E-3:** Wetlands and Aquaculture

In addition, no development buffer around the forests and river is also earmarked as a Conservation. No development should be allowed within the close proximity to it. No development is permitted in this zone, except with the special permission from the DDA.



11.12.9 TRANSPORTATION ZONE (T)

Total 12.79 sq.km of area is specifically earmarked as a Transportation Zone for which permissible facilities as classified as ISBT, Railways, Airports, Parking, Logistics Hubs (Bus Terminals and Truck Terminals), Tele-Communication. Refer the GDCR (General Development Control Regulations) for permissible activities and permissible floor space for each activity.

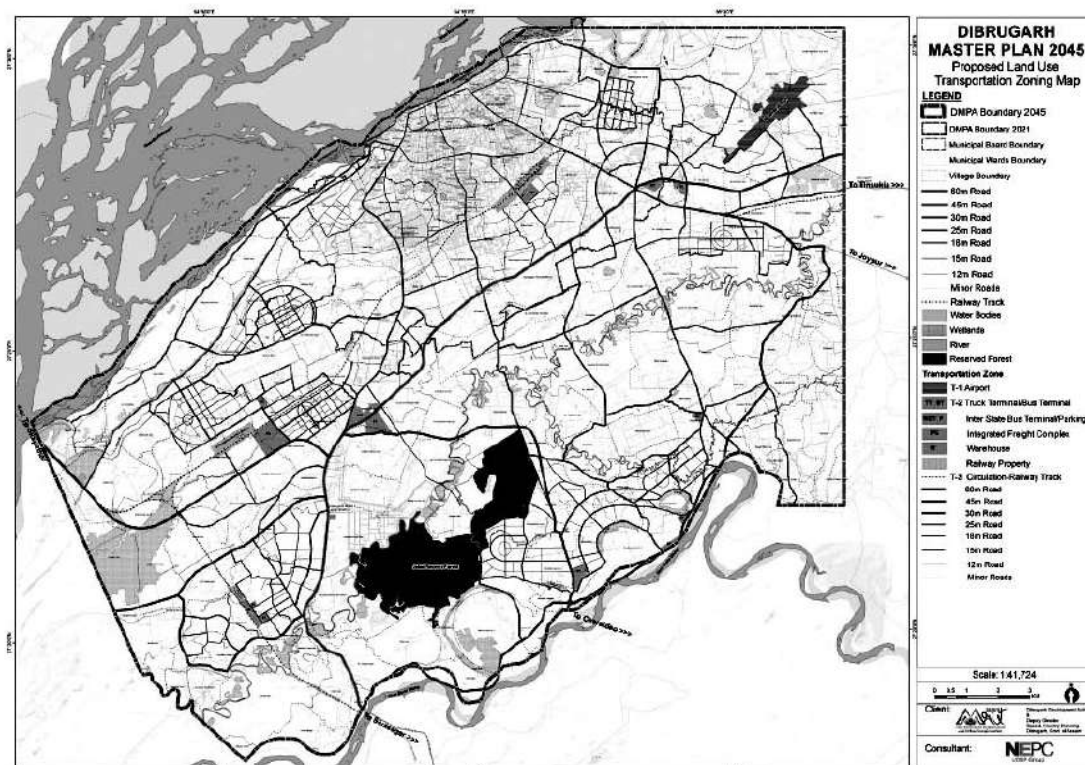


Figure 186 Proposed Transportation Zone Map, DMP 2045

11.12.10 ROAD

The proposed road system together with new linkage is designed to have a proper road circulation throughout the Master Plan area. Road hierarchy is proposed to provide free movement within the Master Plan area. Two Ring Roads have been identified within DMPA to avoid entering the regional traffic into the city center, and will help in relieving the existing congestion in the surrounding of the DMB area. NH 37 that is entering from Gammon Bridge on Burhi Dihing River from South-East and passing through the Boboruah Point, will jointly work as bypass road towards Khanikar chariali upto Bokul Flyover which further extend towards Airport. Outer Ring Road road will be carrying the regional traffic that does not intend to enter the city center and will generally travel towards eastern city centers like Lahowal, Chabua, Tengakhat and Tinsukia.

11.12.10.1 Proposed Hierarchy of Roads

The proposed Master plan for Dibrugarh exhibits a definitive hierarchy in its structure. The proposed road network would increase connectivity within the region, simultaneously helping alleviate traffic problems. The proposed road network is in radial and arterial pattern with hierarchy in structure. The concept is to integrate the existing road of DMB with proposed road in DMPA. The proposed hierarchies of roads are 60mt, 45mt, 30mt, 24mt, and 18mt wide.

60mt Wide Roads:

This is the 1st order road in the proposed road network. Part of National Highway - 37 and Dibrugarh Bypass falling within the DMPA is proposed for 60mt wide. National highway is the main trunk of the proposed road network, as it is connect the entire region with the rest of the India and other states of the seven sisters.

45mt Wide Roads:

This is the 2nd order road in the proposed road network. The Outer ring road of contiguous urban area would be of 45mt wide. The 45 mt wide road will through the traffic coming from NH-15 and NH-37 towards NH-52B, Dibrugarh Bypass and SH-23 without entering to the core city centre area.

These roads are designed as an arterial road. Access to land uses on one or both sides of the arterial roads can be provided through a service road in order to separate the low-speed local traffic from the higher speed traffic. On certain arterial roads, there will also be provision for public transport. This would normally be on the same side of the road as the mixed commercial/residential areas.

Pocket Major Road 30mt Wide:

The proposed 30mt wide roads are second order in the hierarchy of the proposed road network. These roads are working as collector roads and at the nodes; they are well connected with the 45mt wide roads.

The collector road network intercepts traffic from inside the urban areas and feed it into the arterial roads. The proposed cross section of these roads comprises a divided dual 2-lane carriageway with a pedestrian footpaths and a narrow median.

Pocket Minor Road 24mt Wide:

The proposed 24mt wide roads are fourth order in the hierarchy. These routes are originated from with the 45mt or 30mt wide roads and are designed as collector roads. Roads with restricted truck access indicate priority routes for all light traffic (with a limited access for the service trucks during non-peak hours of the day). These routes are intended to provide safe access of the passenger traffic to the surrounding residential areas.

Pocket Minor Road 18mt Wide:

The proposed 18mt wide roads are fifth order in the hierarchy in the urban developable area. These routes are originated from with the 30mt or 24mt wide roads and are designed as collector roads, within DMP area.

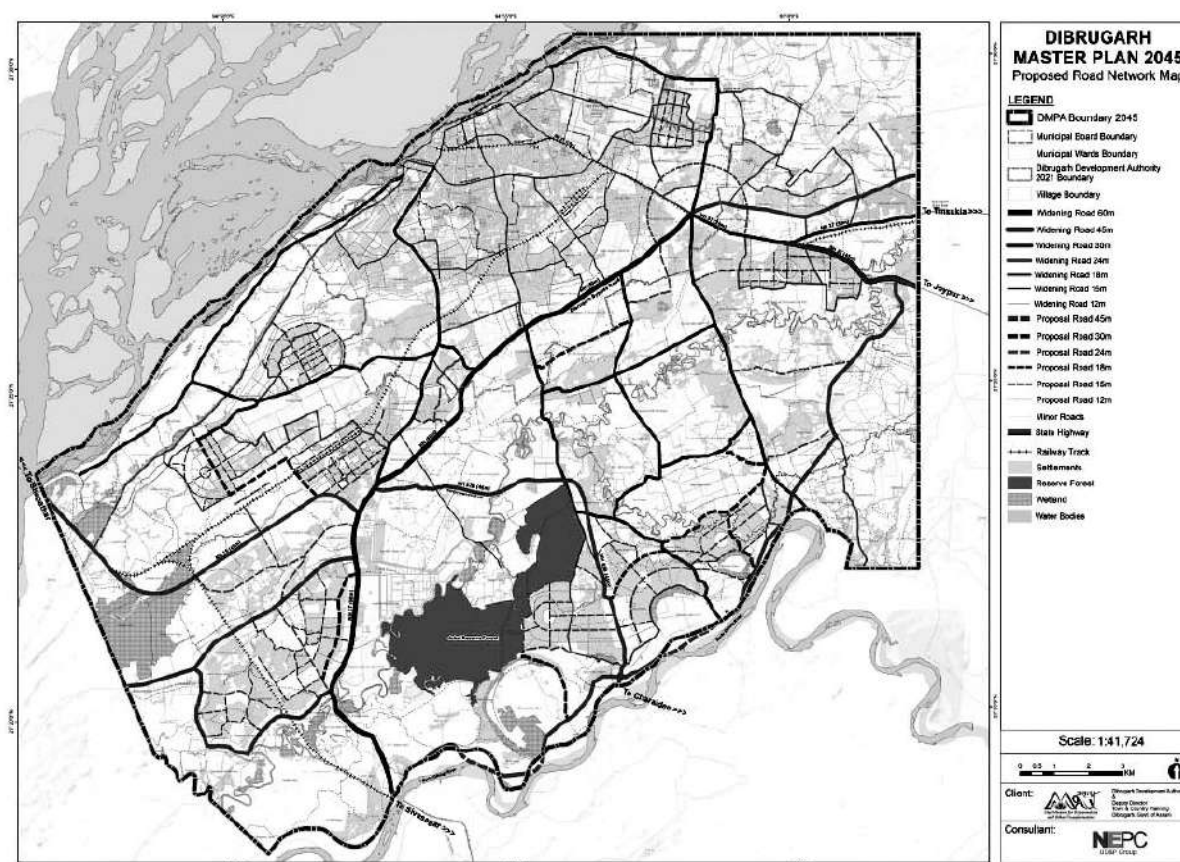


Figure 187 Proposed Transport Network Map, DMP 2045

Each Planning Zone can be put to such use(s) as detailed out in the Master Plan. The proposed Land use Plan indicates the location of broad uses and major facility areas. The requirements of these facilities are subject to necessary modifications when the detailed Zonal Development Plans are conceived. Therefore, the purpose of Zonal/Sub-zonal byelaws and regulations is not to stop the urban development activities in the Planning Area but to serve as broad policy framework for the promotion of planned development. The Master Plan proposes building activity within the prescribed Local Area limits should be controlled and guided by following set of regulations as spelt out in the below table.

The aim of enforcing the regulations is to achieve a desirable development pattern and structure with good quality of life. In order to ensure complete harmony between land uses, town has been divided into various Use Zones including Residential, Commercial, industrial, Recreational, Public & Semi-Public, Transport & Communication, Agriculture, Plantation, Water bodies etc. However, in enforcing master Plan proposals the regulations have been made efficient to avoid inconvenience to public. Mixed land use concept has also been adopted and prescribed which shall need approval of Government. The adoption of mixed land use concept is to enhance functionality of the uses.

11.13 SPACE STANDARDS & DEVELOPMENT AND DESIGN CONTROLS

Space standards are fundamental to obtain the basic objective of Zoning Regulations to achieve desirable pattern of development in each Use Zone. Strict enforcement is needed to achieve articulated urban development as envisaged in the Master Plan.

Table 247 Spatial Norms and Standards

Sl. No.	Description	Standard Prescribed	Plot Area/ Unit (HA)
A	Educational Facilities		
1	Pre-Primary School	1 for 2,500 – 4,000 Population	0.08
2	Primary School (including a playfield)	500 students / 4,000 Population	0.4
3	Middle School (including a playfield)	1000 students or 1 for 7,500 Population	0.6
4	Middle School with Hostel	1000 students or 1 for 7,500 Population	0.75
5	Higher Secondary School (IX-XII)	1000 students or 1 for 10,000 Population	1.6
6	Higher Secondary School (IX-XII) with Hostel	1000 students or 1 for 1,00,000 Population	2
7	Integrated School (Class I-XII) with Hostel	1000 students or 1 for 1,00,000 Population	3.9
8	Integrated School (Class I-XII) without Hostel	1500 students or 1 for 1,00,000 Population	3.5
9	School for Handicapped (including a playfield)	400 students / 45,000 Population	0.5
10	College (including a hostel and playfield)	Students 1000-15000 or 1.25 Lac Population	4
11	University campus without residential quarters	-	10
12	New University Campus with residential quarters	-	30
13	Industrial Training Institute (ITI)	500 students / 10 Lac Population	2
14	Polytechnic	400 students / 10 Lac Population	2
15	New Engineering College	1500-1700 Students	30
16	Medical College with Specialized General Hospital	1500-1700 Students	15
B	Health Care Facilities		
17	Health Unit / Dispensary	1 for 15,000 Population	0.1
18	Nursing Home / Maternity Centre	30 Beds / 1 per 45,000 Population	0.25

19	Polyclinic with some observation beds	1 for 1 Lac Population	0.25
20	General Hospital (300-500 beds) with residential accommodation	1 for 1 to 2.5 Lac Population	6
21	Intermediate Hospital with residential accommodation	100-200 Beds / 1 Lac Population	3.7
22	Intermediate Hospital	80-100 Beds / 1 Lac Population	1
C	Socio-Cultural Facilities		
23	Community Room	1 per 5,000 Population	0.1
24	Community Hall and Library or Multi- purpose Hall	1 per 15,000 Population	0.2
25	Recreational Club	1 per 15,000 Population	0.3
26	Recreational Club	1 per 50,000 Population	0.5
27	Recreational Club	1 for 1 Lac Population	1
28	Music, Dance & Drama Centre	1 for 1 Lac Population	0.2
29	Club Houses	1 for 1 Lac Population	1
30	Museum & Art Gallery with Parking	-	1
31	Community Centre with Hall and Library etc	1 for 15,000 Population	0.3
32	Meditation and Spiritual Centre	1 for 50,000 Population	0.5
33	Botanical / Zoological Park	1 for 1 Lac Population	5
34	Exhibition Area (s)	1 for 1 to 10 Lac Population	10
35	Cinema / Theatre	1 for 1 Lac Population	0.5
36	Stadia / Sports Centre/ Complex	1 for 1 Lac Population	8
37	Mini-Play Field	1 for 2,500 Population	0.75
38	Play Field	1 for 15,000 Population	1.5
39	Religious Place / Structure	1 for 2,000 Population (for all community)	0.2
40	Religious Place / Structure	1 for 10,000 Population (for all community)	0.5
41	Graveyards	1 for 20,000 Population	2
42	Cremation Ground	1 for 50,000 Population	0.5
D	Distribution Services		
43	Post and Telegraph Office	1 for 1.5 Lac Population	0.4
44	Post Office	1 for 40,000 Population	-
45	Telephone Exchange	-	0.2
46	Petrol Pump	1 per 225 ha of Gross Residential Density	0.2
47	Petrol Pump	1 per 40 ha of gross Industrial Density	0.2
48	Milk Booth	1 for 5,000 Population	-
49	LPG Godown	1 for 50,000 Population	0.2
50	LPG Plant with Bottling Facility	-	1
51	Electrical Sub Station of 11 KV	1 for 15,000 Population	-
52	Electrical Sub Station 66 KV	1 for 1 Lac Population	-
E	Police and Fire Services		
53	Police Station	1 for 90,000 Population	1.5
54	Police Post	1 for 40,000 Population	0.2
55	Fire Station	1 for 90,000 Population	1.5
F	Slaughter House		
56	Slaughter House	1 for 1 Lac Population	0.4
57	Abattoir	1 for 1 Lac Population	1

(Source: URDPFI Guidelines, 2014)

12 IMPLEMENTATION AND MONITORING

12.1 PROVISIONS GIVEN IN THE ASSAM TOWN & COUNTRY PLANNING ACT 1959

In order of secure planned development of Dibrugarh Planning Area, it will be important that proposals defined in the GIS Based Master Plan of Dibrugarh are implemented on the ground in letter and spirit. The concept defined in the Comprehensive Master Plan for securing rational development shall not be achieved unless it is adequately supported through a well-defined mechanism for ensuring its proper implementation.

Use and Development of land

As per Section 13 of the Act, no person can use or permit or carry out any development in the Planning area without conformity with the Development Plan after coming into operation of the Development Plan. No development can be taken up by an individual and Department of the Government without the permission of the Competent Authority for which an application shall be made accompanied by documents and fee, as may be prescribed under Section 13(2). Act provides for regulating all constructions / development undertaken by any person including stopping of illegal construction, imposing penalties, demolition of buildings etc.

Acquisition and disposal of land

Section 32 of the Act provides for acquisition of land as per the provisions under Land Acquisition Act, 1894 for public purpose. The Planning Authority may, at any time, and for the purposes of a Development Plan acquire any land with the sanction of the Government. Land is acquired by the Government and then transferred to the Authority for development on payment of compensation.

Levy of Betterment Fee

As per Section 41 of the Act, Every property which has increased in value due to its inclusion within an area under a plan or a scheme or due to the execution of such schemes shall be charged with a betterment fee and such change or development is capable of yielding a better income to the owner, the Planning Authority may levy a not exceeding 1/3 rd of the estimated increase in the value of the land or building for permitting such change in use or development.

12.2 SALIENT FEATURES DEVELOPMENT CONTROL REGULATIONS

For better implementation of the GIS Based Master Plan, it is to be controlled through Development Control Regulations. To derive the Development Control Regulations for Dibrugarh Planning Area, Gross Residential Density is worked out.

As per URDPFI Guidelines 2015, the gross density for developed area of Medium Town (Population having 1 lakh to 5 lakh) in Plain Areas should be 100-150 PPH. As per Census 2011, the population of Dibrugarh Planning Area is 3,61,397 with total area of 391 sq.km. The gross density of the planning area is 9 PPH. The Gross Residential Density is 78 PPH which is nearly matching with the URDPFI guidelines 2015. As per incremental increase method, projected population for year 2045 is 4.96 lakhs for the planning area. For projection year 2045, there can be of more growth and anticipated compared to the growth rate of the previous decades. The reasons for that are cited in chapter 2.5 Population Projection 2045. For year 2045, projected population is coming to be 5.51 lakhs. By considering projected population of 5.51 lakhs, the proposed gross residential density is worked out to be 62 PPH which can be considered as per the URDPFI Guidelines 2015.

12.3 POLICY FRAMEWORK RELATED ACTIONS

It will be important to focus on following to achieve the effective implementation besides promoting planned development of the local area. This should include:

- Putting in place appropriate order of manpower in Town Planning and Engineering division within the Authority
- Creating a dedicated Enforcement Wing for implementing the Master Plan
- Creating Land Bank – creation of inventory of Government Land through which status of Government land can be monitored (buying & selling of Government Land)
- Looking at new options for generating resources for funding the development work for making urban development self – financing.
- Involving Private, Corporate and Cooperative Sectors as major partners in the Planning, Development & Implementation of Master Plan through an investor friendly framework.
- Creating awareness among people about the role and importance of Comprehensive Master plan including its major provisions and schemes to make local citizens as partners in the development process and in providing appropriate quality of life.
- Creating a High-Powered Board for coordinating the activities of various departments operating within the planning area and define Policy Framework for implementation of GIS Based Master Plan 2045.
- Maintaining a GIS based system for updating database and monitoring of Master Plan implementation (Master Plan 2045 is already prepared on GIS platform which has to be updated time to time)
- Phasing of development and developing trunk infrastructure including major roads, water supply, sewerage, drainage or electricity etc. as per priority.
- Formulation of the annual plan and identification of projects for implementation within the framework of approved Master plan - adopting Project Based Approach.
- Transforming the role of Government /Authority from 'Provider to Enabler' and devising innovative methods of resource mobilization.
- Making use of different central and state government schemes to finance major proposals in the DMP 2045.

12.4 LAND POOLING AND PLOT RECONSTITUTION FOR PLAN IMPLEMENTATION

Based on the pattern followed in states of Maharashtra and Gujarat, DMP 2045 advocated the use of land pooling and reconstitution mechanism to manage, service, reconstitute the private land and promote planned development. The mechanism involves development without acquisition of land involving land owners as equitable interests in the development process. The entire development cost is generated out of part sharing of increase in land values due to planned development of the area. Land is earmarked for roads, open spaces, parks, play grounds and amenities including healthcare and education. Planning Authority also gets land from the scheme, which is disposed off by the designated agencies to raise resources to meet the development cost and pay the cost of land, which is used for public purpose, etc. Land owners get full compensation of land, which is used by public agencies and shares the cost of development. The scheme is prepared in consultation with land owners, which minimize the chances of conflict between land owners and the Planning Authority. Development agency on its parts gets land for roads, open spaces, amenities, etc. free of cost

without resorting to land acquisition. The developed land which is made available to land owners can be disposed off by him in the open market at a negotiated price fetching him higher returns.

Land Pooling and Redistribution Scheme (Town Planning Scheme)

It is a land development technique undertaken by the land owners who pool their land to receive a good layout, following a procedure involving:

- Notifying an area for Town Planning Scheme.
- Pooling of land of different land owners to the Authority.
- Preparing a detailed scheme as per the provision of Master Plan indicating the original and final plots, roads, open spaces, amenities, involving the land owners.
- Redistribution of final plots after charging betterment contribution and paying compensation for the land used for public purposes, transferred to the local authority.
- The role of development authority remains most critical in order to finalise the scheme by involving land owners, preparing layout plans, getting it approved from land owners and the state government and ensuring execution of scheme. In the entire process land is developed as per the plan involving no acquisition of land. This is the major feature which distinguishes Town Planning Scheme from other modes of land assembly like bulk acquisition or bulk acquisition of selected land for public amenities. After the Town Planning Scheme is finalized, entire land earmarked for public purposes involving roads, open spaces, amenities, etc. vests with the local authority without paying any compensation and is generally called "Land Acquisition without tears". It makes land owners also happy because they lose only part of their land used for public purposes and get the remaining land after planning with freedom of disposal in urban markets. Compensation is also paid to the land owners for the land which is used for public purpose. However, the scheme has been found to popular in large cities with adequate demand of land. Scheme has one drawback that it takes considerable time for finalization. However, the model adopted by state of Gujarat for speedier framing of T. P. Scheme could be used for formulation of T. P. Scheme on time bound basis. This method can be considered for adoption by Dibrugarh Planning Authority after detailed study of various aspects of the scheme and legal framework required to make these schemes a reality. It would also require placement of trained manpower to be put in place to frame and finalise the T.P. Scheme.

Spatial planning of any urban area tends to increase the land value of that area. A further increase takes place when the actual development works start. It's a common experience that ULBs excepting a few municipal corporations lag badly in executing the development works which mainly consist of basic civic services. This is mainly on account of the paucity of funds. Since the spatial planning and the development works tend to increase the land prices, it was thought necessary to mop up a part of the incremental increase in prices for the purpose of carrying of the developmental work. Traditionally this has been sought to be achieved by levying charges at two stages termed betterment charges and development charges. As soon as the spatial planning is finalised, the authorities responsible for spatial planning levies a charge termed as betterment charges.

Unfortunately, this charge, however, does not lead to any net income for the planning authority. This is because the entire rationale seems to be individual owners of plot are going to surrender land owned by them for the development works and therefore, are entitled to some compensation. The cost of carrying on the planning work will be offset. Therefore virtually there will be no net income to the planning authority.

Anticipated expenditure for laying of roads and various other civic services. Part of the increment of land value on account of this is sought to be mocked up by levying the development charges. However, actual

amount generated falls much below the expenditure for levying the services. Secondly, this charge is levied and collected when a person owning a plot comes for actual development on that plot. Here also this hardly serves the purpose of effectively providing the fund backup needed for actually executing development jobs.

The government has therefore in various states has made provision for a part of the land under development to devolve on the spatial planning authority. The idea is that funds generated by the sale of the devolved land would be helping the institutions to carry on the development works, if need be, by borrowing funds from the public finance institutions by putting the sum as margin money.

In case the state government agrees to resorting to land pooling methodology for executing town planning, the suitable provisions can be made for reservation of land for the planning authority for generating funds needed for actual development. In this context, as is being done in Maharashtra and Gujarat.

12.5 PHASING AND COSTING

The successful implementation of a Master Plan is depending on the availability of resources with the implementation authority and the concerned department. The availability of funds sets the guidelines for the development for various proposed projects of the planning area. The different proposals for Dibrugarh Master Plan (DMP) have been drawn up for achievement over the period up to 2045 have given a broad estimate of investment to be undertaken.

This is an indicative investment plan, it would be imperative to find out sources of enhanced capital finances to be able to carry out the required investment. Further, it has been a common phenomenon that many of the capital expenditure has not been sustained properly leading the delivery of services to suffer. Therefore, sustenance of capital expenditure in terms of operation and maintenance of assets created becomes all the more important and this force for identification of different revenue generating options.

Phasing is done for the development to take place incrementally over the period of time, according to the financial resources available. Initial projects are to be selected in such a manner that they act as catalysts for economic growth of the city. Generally, it includes projects such as knowledge cities, business and high tech parks and commercial centres etc. These will cause huge inflow of people to the city for education and employment.

For Dibrugarh Planning area, the implementation of the proposals is divided into three phases; short term, Medium term and long term. The proposals to be implemented in these phases are described below:

12.5.1 SECTOR-WISE INVESTMENT PROPOSAL

The sector wise investment requirement for the implementation of various projects of Dibrugarh Master Plan is detailed in table below.

Table 248 Sector Wise Investment for Dibrugarh Planning area

Sr.No.	Location	Project Name	Total Project Coast (in lac.)	Cost in Phase I (in lac.)	Cost in Phase II (in lac.)	Cost in Phase III (in lac.)
Urban Development						
1	Core area of Dibrugarh Town	Urban Renewal of Core Old Areas of Dibrugarh Town	500	250	250	-
2	Core area of Dibrugarh Town	Development of Heritage Buildings of Dibrugarh Town	100	50	50	
3	Distributed in Town	Rehabilitation of Slums dwellers along Brahmaputra river and on Water Bodies located in Planning Area	2500	1500	1000	
4	Dibrugarh Planning Area	Green Belt around Industrial area and Wetlands	150	100	50	
5	Tingkhong Gaon	Neighbourhood Centre at Ward 15 (9.3 Ha)	820	820		
6	Subha Chuck Gaon	Neighbourhood centre at Subha Chuck Gaon (9.26 Ha)	918		918	
7	No. 122 Burahajar Konwar Gaon	Neighbourhood Centre at No. 122 Burahajar Konwar Gaon (7.8 Ha)	680			680
8	No. 1 Mancotta	Neighbourhood centre at No. 1 Mancotta (5.08 Ha)	500			
9	Niz Mankatta Gaon (CT)	Neighbourhood Centre at Niz Mankatta Gaon (5.31 Ha)	480		4800	
10	Mohpowalimora Gohain Gaon (OG)	Neighbourhood centre at Mohpowalimora Gohain Gaon (7 Ha)	700		700	
11	Mahmaripather Gaon	Neighbourhood Centre at Mahmaripather Gaon (8 Ha)	810			810
12	Lepetkata Gaon	Neighbourhood centre at Lepetkata Gaon (11.04 Ha)	1010		1010	
13	Lekai Gaon	Neighbourhood centre at Lekai Gaon (6 Ha)	700	700		
14	Konwar Kheroni Gaon	Neighbourhood centre at Konwar Kheroni Gaon (13.4 Ha)	1200	1200		
15	Japara Gaon	Neighbourhood centre at Japara Gaon (7 Ha)	600			600
16	Hatimura Gaon	Neighbourhood centre at Hatimura Gaon (12 Ha)	1100		1100	
17	Hahchora Gaon	Neighbourhood centre at Hahchora Gaon (12 Ha)	1000	1000		
18	Ghitira Pather	Neighbourhood centre at Ghitira Pather (6 Ha)	700		700	
19	Dibruwal Changmai Gaon	Neighbourhood centre at Dibruwal Changmai Gaon (12.56 Ha)	1100			1100
20	Bhurbhuri Gaon No. 3	Neighbourhood centre at Bhurbhuri Gaon No. 3 (12.11 Ha)	1050		1050	
21	Chengamari Tekela Gaon	Neighbourhood centre at Chengamari Tekela Gaon (8 Ha)	910	910		
22	Ward 4	Affordable Housing (2 Ha)	2000	2000		
23	Tinsukia Gaon	Affordable Housing (3 Ha)	3000		3000	
24	No. 2 Bhurbhuri Gaon	Affordable Housing (9.5 Ha)	9500			9500
25	No. 150 Dibruwal Dihingia Gaon	Affordable Housing (21 Ha)	21000	10000	11000	

26	No. 1 Mancotta	Affordable Housing (2 Ha)				
27	No 186 Binoi Gutia	Affordable Housing (11 Ha)	11000			11000
28	Mankota 1/159 No. RR (A)pt	Affordable Housing (2 Ha)	2000	2000		
29	Mahmaripather Gaon	Affordable Housing (13 Ha)	13000	13000		
30	Jokai Region	Affordable Housing (11 Ha)	11000			11000
31	Hatimura Gaon	Affordable Housing (3 Ha)	3000		3000	
32	Dewanbari Bengali Gaon	Affordable Housing (5 Ha)	5000		5000	
33	Chamoguri Kasari Gaon	Affordable Housing (15 Ha)	15000			15000
Public Semi Public Places						
34	Niz Khanikar	Administrative Block (50 ha)	50000	25000	25000	
35	Jalan Tea Estate, Convoy Road	International Convention Centre (ICC) (25 ha)	20000	20000		
36	Bogpara Gaon	District Library	300		300	
Water Supply System						
37	Dibrugarh Planning Area (DMPA)	Preparation of DPR for Water Supply System for Dibrugarh Planning Area	120	120		
38	Existing Dibrugarh Town	Water Supply System sanctioned under AMRUT	100	50	50	
39	Existing Dibrugarh Development Authority Area	Improvement of Water Supply System of Dibrugarh	3000	1500	1500	
40	Dibrugarh Planning Area	Hand Pump water Distribution System	1000	500	500	
Power						
41	Existing Dibrugarh Master Plan Area	Renovation and modernization of 33/11 KV and 11 KV / 440 V sub- stations	400	200	200	
42	Existing Dibrugarh Master Plan Area	Installation of new transformers and capacity augmentation of existing transformers	650	300	350	
43	Existing Dibrugarh Master Plan Area	Metering of All connections	200	100	50	50
44	Existing Dibrugarh Master Plan Area	Installation of a HVDS (High Voltage Distribution System)	500	250	150	100
45	Dibrugarh Planning Area 2045	Preparation of DPR for Power Supply System for Dibrugarh Planning Area	200	200		
Sewerage System						
46	Dibrugarh Planning Area	Preparation of DPR for Sewerage System for Dibrugarh Planning Area	70	70		
47	Dibrugarh Planning Area	Laying of Sewer Network for Planning Area	5000	2500	1500	1000
48	Konwar Handique Gaon	Construction of STP (35 MLD) on 4 Hectare of Land	700	400	300	
49	Dewanbari Bengali Gaon	Construction of STP (35 MLD) on 5 Hectare of Land	680		350	330
50	Bhurbhuri Gaon No. 3	Construction of STP (35 MLD) on 5 Hectare of Land				
51	Jokai T.E Co. 29/143 ORR	Construction of STP (25 MLD) on 5 Hectare of Land	450		450	

Solid Waste Management						
52	Dibrugarh Planning Area	Improvement and Modernization of Solid Waste Collection, Transportation and Disposal System of Dibrugarh	250	250		
Drainage System						
53	Dibrugarh Planning Area	Preparation of DPR for Drainage System for Dibrugarh Planning Area	70	70		
54	Dibrugarh Town	Cleaning and maintenance of existing main drains	1000	500	500	
55	Dibrugarh Planning Area	Laying of Roadside drains in new proposed areas within Dibrugarh Planning Area	3000	1000	1000	1000
56	Dibrugarh Town	Construction and Improvement of Existing Storm Water Drains	5000	2500	2500	
57	Dibrugarh Planning Area	Slope protection, Improvement, Construction, Repair & Restoration	100	100		
Water Bodies						
58	Dibrugarh Planning Area	Repair and Renovation of Water Bodies in Planning Area	1000	500	500	
59	Dibrugarh Planning Area	Development of Green Conservation Belt around all water bodies	500	250	250	
60	Dibrugarh Planning Area	Development of Brahmaputra River Front Under Progress (Bank Stabilization Work)	2500	1500	1000	
61	Dibrugarh Planning Area	Development of Burhi Dihing river with joggers track as recreational zone	1000	500	500	
62	Dibrugarh Planning Area	Development of water sport complex as recreational zone	2000	500	1000	500
63	Bhurbhuri Gaon No. 2	Rejuvenation of Kathbil with organized open space	1000		500	500
Traffic and Transportation						
64	Dibrugarh Town	Repair and Renovation of Existing Road Network of Dibrugarh Town	2500	1500	1000	
65	Ward 9	Improvement and Conservation of old Dibrugarh Town Railway Stations	1000	500	500	
66	Tepar Gaon Pathar	Development of Dhamalgaon Railway Station	500	250	250	
67	Changmai Gorla Gaon	Development of ISBT (26 Ha)	500	500		
68	No. 172 Tepar Gaon Pather	Development of Intermediate Freight Complex (60 Ha)	3000			
69	Bairagimath Kachari Gaon	Development of Bus Terminal (14 Ha)	200	200		
70	Patra Gaon	Development of Bus Terminal (9 Ha)	90		90	
71	Tinsukia Gaon	Development of Bus Terminal (8.5 Ha)	90			90
72	Dhargatdi Gaon	Development of Bus Terminal (7 Ha)	80		80	
73	Bhurbhuri Gaon No. 3	Development of Bus Terminal (25 Ha)	500			500
74	Ward 19	Development of Jalan nagar Bus Terminal	50	50		
75	Lepetkata Kachari Gaon	Development of Truck Terminal (35 Ha)	300	300		
76	Bokel Bari Tea Estate	Development of Truck Terminal (10 Ha)	150		150	
77	Bhurbhuri Gaon No. 3	Development of Truck Terminal (6.25 Ha)	100			100
78	Dibrugarh Planning Area	Preparation of DPR on City Mobility Plan	30	30		

79	Dibrugarh Planning Area	Construction of City Ring Road	20000	10000	5000	5000
80	Dibrugarh Planning Area	Construction of Outer Ring Road	38000	10000	10000	18000
81	Dibrugarh Planning Area	Improvement of Traffic Signal facility in Dibrugarh Planning Area	600	300	200	100
82	Dibrugarh Planning Area	Augmentation of City Bus Fleet	1000	400	400	200
83	Dibrugarh Planning Area	Construction of Non-motorised Transport facilities (Footpaths & Cycle Tracks & Cycle Parking)	1600	600	500	500
84	Bairagimath Kachari Gaon	Construction of Cycle parking near Bus stand	300		200	100
85	Bairagimath Kachari Gaon	Construction of Multi level Parking at Banipur Railway Station	1500	1500		
86	Ward 9	Development of Multilevel Car Parking near Town Railway Station	400	400		
87	Ward 6	Development of off- street Car Parking	200	200		
88	Ward 5	Development of off- street Car Parking	150		1500	
89	Ward 4, Near Jalan Tea Estate	Construction of off-Street Parking	200	200		
90	Banipur Railway Station	Construction of Road Over Bridge on road near Banipur Railway Station	1005	1005		
91	Mancotta Road	Construction of Road Over Bridge on Railway Track	1500	1500		
92	Bypass Road, Khanikar Cross road	Dvelopment of Khanikar Fly over on Dibrugarh Bypass Road	900	900		
93	Bogpara	Dvelopment of Bogpara Fly over on Dibrugarh Bypass Road	900		900	
94	Nh-37, Borboruah Point	Dvelopment of Fly over at Borboruah Point towards Bypass road	1000	800	200	
95	NH-15, Sukafa Point	Dvelopment of Fly over at Sukafa Tinali from Bogibill	900		900	
Commercial						
96	Bokul Gaon	Development of Commercial/ District Centre (31 Ha)	1500	500	500	500
97	Patra Gaon	Development of Commercial/ District Centre (20 Ha)	800		800	
98	Chengmari Tekela Gaon	Development of Commercial/ District Centre (15 Ha)	700	300	450	
99	Hiloibam Gaon	Development of Integrated Commercial Centre (40 Ha)	4000		1000	2000
100	No. 2 Bhurbhuri Gaon	Development of Integrated Commercial Centre (11 Ha)	1000		500	500
101	Ward 4	Development of Vending Zone (2 Ha)	70	70		
102	No 186 Binoi Gutia	Development of Vending Zone (10 Ha)	350		350	
103	Mohmari Gaon	Development of Vending Zone (8 Ha)	200			200
104	Bhurbhuri Gaon No. 3	Development of Vending Zone (14 Ha)	400			400
105	Changmai Gorla Gaon	Development of Wholesale and Trade Centre (15 Ha)	3000	1000	2000	
106	Bhurbhuri Gaon No. 3	Development of Wholesale and Trade Centre (10 Ha)	1000			1000

Social Infrastructure						
107	Garudharia Gaon No. 1	Development of Multi-Specialist Intermediate District Hospital (13 Ha)	900		900	
108	Lahowal Chah Bagicha	Development of Multi-Specialist Intermediate District Hospital (14 Ha)	900		450	450
109	No 186 Binoi Gutia	Development of Multi-Specialist Intermediate District Hospital (7 Ha)	450	450		
110	Bhurbhuri Gaon No. 3	Development of Health Centre (13 Ha)	800		400	400
111	No. 150 Dibrual Dihingia Gaon	Development of Health Centre (13 Ha)	800		400	400
112	Sapekhati Gaon	Development of Health Centre (11 Ha)	700	350	350	
113	Bogpara Gaon	Development of Knowledge District (142 Ha)	14000	4000	10000	10000
114	Lekai Gaon	Development of Knowledge District (92 Ha)	9000	4000	2500	2500
115	Hiloibam Gaon	Development of Knowledge District (64 Ha)	7000		3500	3500
116	Sapekhati Gaon	Development of University (80 ha)	7200		4000	3200
Recreational						
117	Jokai R.F.	Development of Botanical Garden (18 Ha)	300	100	200	
118	Charbandi Chuk Zarua	Development of District Sport Centre cum Complex (9 Ha)	900	450	450	
119	Lepatkata	Development of District Sport Centre cum Complex (15 Ha)	1200		800	400
120	Chota Bogpara	Development of District Level Park (10 Ha)	1000	500	500	
121	Kushia Khana gaon	Development of Cultural Complex (70 Ha)	7000		3000	4000
122	Niz Khanikar	Development of Science City (20 ha)	5000	2000	2000	1000
123	Niz Khanikar	Development of Stadium (10 ha)	8000	4000	4000	
124	Mohmari Gaon	Development of Theme Park (120 ha)	120000	50000	50000	20000
125	Near Jokai R.F.	Development of Theme zoo (95 ha)	5000	2000	2000	1000
126	Mohmari Gaon	Development of Exhibition Ground (30Ha)	1000	500	500	
127	Dibrugarh Planning Area	Development of Water Sport Activity at Burhi Dihing water Body	100	75	25	
128	Hanchora	Development of eco-village tourism at Hanchora	500			500
129	Dibrugarh Planning Area and Surrounding Region	Development of Spiritual Circuit (Development of Infrastructure at BJagannath Temple, Radha Krishna Temple, Maira Mora than, Aai Than, in Dibrugarh Planning Area)	200	100	50	50
Industrial Area						
130	Tepor Gaon Pathar and Chnagmari Gohain gaon	Development of Industrial Estate – I (300 Ha)	35000		25000	10000
131	Niz Lahowal	Development of Industrial Estate – II (100 Ha)	9000	5000	4000	

12.5.2 TOTAL INVESTMENT PROPOSAL

The Master Plan of Dibrugarh Planning Area will require a total public and private sector investment of approx. Rs .5447.08 crores till horizon year 2045. The summation of all the costs of sectoral level plans provide the total estimate as detailed in Table below.

Table 249 Summation of Sectoral Investment Plan for Dibrugarh Planning Area

Sr.No.	Sector	Sector wise Investment Plan (Crores)
1	Traffic and Transportation	792.40
2	Physical Infrastructure	231.70
3	Social Infrastructure	417.50
4	Commercial Development	130.20
5	Recreational	1502.00
6	Environment and Ecology	80.00
7	Mixed use/Neighbourhood centres	1853.28
8	Industrial	440.00
Total		5447.08

(Source: Consultant Compilation)

12.6 RESOURCE MOBILISATION

Availability of adequate resources is essential for the successful implementation of the Master Plan. This demands rejuvenation of urban centers to attract more and more investments in those areas. Implementation of the Master Plan requires huge amount of financial resources and it is impossible for the Planning Authority to bear such huge amount of money. There are certain fiscal mechanisms that can be adopted for mobilizing the financial resources.

Land remains the critical element of urban development and accordingly can be leveraged to raise resources for urban development and implementation of the DMP. Land values remains closely linked with the use to which the land is put and permission is granted to use the land in urban context. From the experiences, it is found that the only mechanism to fund the urban infrastructure is to undertake and promote planned development either by the parastatal agencies or by the private, cooperative, corporate sectors. Both these mechanisms can be leveraged by Development Authority to raise resources/ implement the DMP provided the legal framework permits the same and authorizes the Authority to regulate it.

12.6.1 LAND BASED FINANCING MECHANISMS

Apart from the government grants or development funds from the upper tiers of government, the ULBs would require adequate funds from their own sources to meet the objectives of facilitating urban development. Thus, it is inevitable for any local body to generate revenue. Table below shows categorywise sources of revenue of ULBs in India. Most of the ULBs use tax sources and grants to finance their activities, while the other sources of revenue are often ignored or not tapped to the potential that exists. For example, public debt available from market – both institutional and individual/retail investors – is rarely accessed to finance the creation of new urban development infrastructure.

Table 250 Municipal Revenue Sources in Indian states/ULBs

Revenue Head/Category	Sources of Revenue
Tax Revenue	Property Tax, Advertisement Tax, Tax on Animals, Vacant Land Tax, Taxes on Carriages and Carts
Non-Tax Revenue	User Charges, Municipal Fees, Sale & Hire Charges, Lease amounts
Other Receipts	Sundry receipts, Law charges costs recovered, Lapsed deposits, Fees, Fines & Forfeitures, Rent on Tools & Plants, Miscellaneous Sales etc.
Assigned (Shared) Revenue	Entertainment Tax, Surcharge on Stamp duty, Profession Tax, Motor Vehicles Tax
Grant-in-aids	(i) Plan Grants made available through planned transfers from upper tier of Government under various projects, programmes and schemes (ii) Non-Plan Grants made available to compensate against the loss of income and some specific transfers
Loans	Loans borrowed by the local authorities for capital works etc. – HUDCO, LIC, State and Central Governments, Banks and Municipal Bonds

(Source: Mohanty P.K., 'Financing Urban Infrastructure: Some innovative Practices of Resource Mobilisation, CGG working paper, June 2003)

Municipal Resource mobilization needs not only strengthening the existing revenue sources but also using other sources of revenue. Therefore, both conventional and non-conventional sources need to be tapped to the extent possible within the City. The ULBs may benchmark their levy and utilization with reference to the better performing peers within the State as well as outside it. The ULBs may use the general principles of users pay, beneficiaries pay and polluters pay to the justification such that the citizens are well aware of the need for their contribution towards larger societal cause. Table below shows conventional and non-conventional resources that can be tapped by the ULBs.

Table 251 Conventional and non-conventional revenue resources

Sr.No	Service Revenue Source	Conventional Source	Non-Conventional Source
1	Property Related	Composite Property Tax	Vacant Land Tax, Service Taxes, Surcharge on Land Registration Duty
2	Water Supply Related	Water Charges	Water Supply Donations, Water Supply Connection Charges, Water Benefit Tax, Water Betterment Charges
3	Sewerage Related	Sewerage Charges	Sewerage Donations, Sewerage Connection Charges, Sewerage Benefit Tax, Sewerage Betterment Charges
4	Solid Waste Management Related	Conservancy Charges	Bulk Garbage Collection Charges
5	Town Planning Related	Building Permit Fee, Development Charges	Betterment Charges; External Betterment Charges; Open Space Contribution; Impact fee; Transferable Development Right; Premium FSI, Sub-division charges; Planning Permission Betterment
6	Engineering Related	No Sources	Road Cutting Charges, Street Tax, Frontage Tax, Cess on Infrastructure, Motor Vehicle Tax/Surcharge on Tax on Petrol and Diesel
7	Trade Licensing Related	Trade Licensing Fee	Business License Fee
8	Advertisement Related	Advertisement Tax	Hoarding Charges, Advertisement Placement Fees, Cable TV Fee, TV Advertisement Charges
9	Shops and Establishment Related	Shop Room rent	Royalty on Auctions

(Source: Mohanty P.K., 'Financing Urban Infrastructure: Some innovative Practices of Resource Mobilisation, CGG working paper, June 2003)

- **Change of Land Use Charges for change of land use from one use to another:** The landuse conversion charge is determined by the newly permitted landuse of that area which is capable of yielding a better income for the land owner.
- The Assam Town & Country Planning Act, 1959 provides for levying Development Charges on landowners. Where permission for a change in the use or development of any land or building is granted in the whole or any part of the planning area, and such change or development is capable of yielding a better income to the owner, the Planning Authority may levy a charge not exceeding 1/3rd of the estimated increase in the value of the land or building in the prescribed manner for permitting such change in use or development.
- **FAR:** Intensity of land utilization depending upon Floor Area Ratio (FAR). Higher FAR means higher order of charges to be paid –tradable FAR.
- **Internal Development Charges and External Development Charges (IDC and EDC):** Instrument of development charges have been used extensively to recover the cost of providing new service and infrastructure in areas proposed to be covered by Master Plans. This mechanism has helped in providing development within the approved colonies in terms of roads, water supply, sewerage, sanitation, drainage, electricity etc. besides the social infrastructures involving education, health care, landscape etc. without involving any cost to the Planning Authority as these costs are loaded as integrated part of pricing of developed plots which are made available to people after development.
- In addition to internal development charges, charges for external development are also collected by development agencies. These charges include the cost of providing city level services involving arterial / ring roads, bypasses, under bridges /over bridges, water treatment plants, sewage treatment plants, major electrical network, trunk services, city level healthcare, education and other services. This is done through the process of working out total cost of development, as per the proposals defined in the development in the master plan. Based on the total developed area under different uses, external development cost is worked on the unit basis of area which is then charged from the developers while granting permission for development. External Development Charges (EDC) is then pooled in the City Development Fund which is then used for funding various projects prepared as per the provisions of the development plan.
- **Vacant land taxes:** levied on vacant land kept within the urban limits to minimize speculation and raise money on account of non-utilization of urban services.
- **Tax on land value increase:** Land values continue to increase in urban context due to various development projects undertaken by the Planning Authority (for eg. GIS Based Master Plan) and economic phenomenon of rise in general prices. A basic objective of Land Value Increment Tax is to capture some of this increase for the benefits of the community. This kind of tax is widely used in numbers of countries including Italy, Malaysia, Australia, Korea, Canada and New Zealand.
- **Planning Charges:** Since preparation of master plan, zonal plan and working out detailed schemes and granting planning permission involves expenditure on the part of Planning Authority, accordingly they can be recovered as integral part of the planning permission so as to raise resources. Further, this approach will help in effective implementation of the Master Plan through increased intervention of planning system.
- **Sale or lease of publicly held land:** Public land assets are sold to private parties. This mechanism requires a detailed inventory of government land, market valuation and strategic decisions about the best use of a particular land. Auctions shall be open for the disposal of land. The provision for this mechanism is given in Section 34 of Assam Town and Country Planning Act 1959.
- **Remunerative Projects:** Planning Authority should take up remunerative projects which augment financial

positions and generate revenue for the Authority and subsequently social infrastructure projects can be taken up out of the funds generated from the same. Income from remunerative projects is in the form of rental income from properties like shopping complexes, market fees, parking fee and income from other real assets owned by the DDA.

TOD	Land Pooling	PREMIUM FSI	External Dev Charges	Transfer of FSI
<ul style="list-style-type: none"> • Catalyst for real estate market • Encourage people to use Public Transport • Systematic Densification • Finance generation 	<ul style="list-style-type: none"> • Micro Level Planning • Planned and equitable development • Resource generation for govt and land owner 	<ul style="list-style-type: none"> • Use of additional FSI for resource generation • Densification of specific areas • Maintain the skyline 	<ul style="list-style-type: none"> • Mentioned in the Act • Can be area based 	<ul style="list-style-type: none"> • Can be done for Slum Rehabilitation • Resource generation for the Authority/ Municipality

Figure 188 Resource Mobilisation

The ULBs need to exploit various land based revenues, which have greater implication to urban growth and development and concomitant problems like slum formation, redevelopment, rehabilitation and resettlement. The funds realized from land based revenue sources can be effectively deployed for the improvement of urban poor people living in the slum areas. Several of these sources may already exist in the ULBs but the potential of the same may not have been exploited to fullest extent. Also, there are several other forms of revenues (or, variants of revenues) that need to be tapped and exploited.

12.6.2 INVOLVING PRIVATE SECTORS

Considering the enormity of urban development, requirement of enormous resources, level of service/ infrastructure required to ensure appropriate quality of life in Dibrugarh, it will be critical to involve large number of reputed players in the urban development process in order to ensure effective implementation of master plan. With limited resources available with the parastatal agency, achieving the objective of the comprehensive development plan and its effective implantation appears to be a remote possibility. Accordingly, it will be desirable to make private sector as an active and supportive partner in the process of development and implementation of the Master Plan 2045.

Mechanism of involving private sector will have to be defined clearly in a transparent manner through well-defined policy and legal framework in order to remove any mismatch or ambiguity. Level playing fields have to be created between Private and Public sectors so as not to put private sector in a position of disadvantage. A supportive and exclusive mechanism/ framework will have to be put in place to provide time bound clearance to the private sector development, meeting all the defined norms, standards and conditions of development. Attempt should be made to attract reputed developers in the state in order to usher a new era and culture of urban development. Minor developers should be avoided in order to minimize the chances of mushrooming planned development and ensure provision and development of integrated city level services. Minimum chunk of land to be developed should be defined which can be sustained as self-contained neighbourhoods having all basic amenities of services, physical / social infrastructures to meet the day to day needs of residents. Well-defined standard of development shall form integral part of such development, so that uniformity of development is ensured.

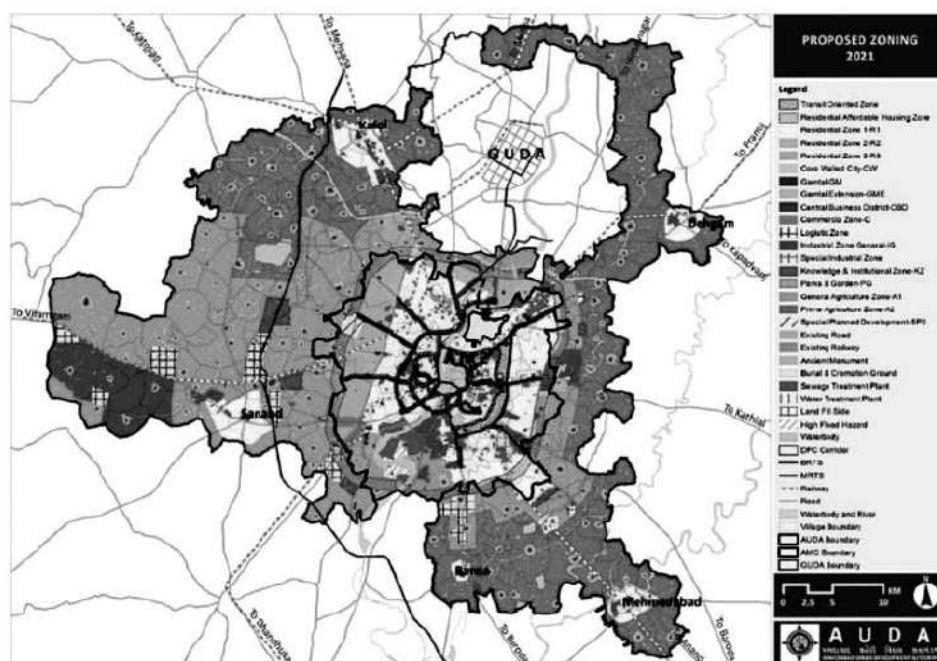
Licensing of developers would be integral and critical part of involving private developers in order to ensure their liability for the development works taken up by them. Legal, institutional and procedural framework for involving private sector in urban development / implementation of master plan needs to be worked out on the basis of detailed study carried out of the pattern adopted by states of Haryana, Punjab, Uttar Pradesh, Maharashtra, Gujarat (where they have put in place successful models of urban development involving private sector. However, such model would need modification depending on the conditions existing in the Dibrugarh to make it successful operationally.

12.6.3 BEST PRACTICES

Land Management Process- Gujarat As the city grows, more land in the surrounding regions gets transformed from rural to urban uses. In the absence of an effective mechanism, this transformation is haphazard and results in congestion and low levels of infrastructure provision. To ensure planned new growth, most cities rely on largescale land acquisition and development of planned layouts. However, this becomes difficult with the increase in land values as well as the active resistance to displacement by displaced landowners. Therefore, it has become imperative to introduce more fair, equitable and inclusive methods of land consolidation that cause minimal displacement if at all. The good example of such a mechanism is from the land process of Gujarat.

Urban planning in Gujarat is a two-step process as prescribed in the GTPUDA and its Rules. The first step is to prepare a "Development Plan" (DP) for the entire city or development area. The second step is to prepare "Town Planning Schemes" (TPS) for smaller portions of the development area for which the Development Plan is prepared.

1. Development Plan (DP)



- Provides Overall Development Framework
- Overall Direction of Urban Expansion
- Land use Zoning
- City level road network
- City Level Infrastructure (Utilities & Amenities)
- Reservations of Land for other Public Purposes
- Reservations of Land for Housing for Urban Poor
- Transport Planning
- Development Control Regulations (DCRs)

2. Town Planning Scheme (TP)

- It is an effective instrument for implementation of Master plan
- It is whole to part- Master plan is Macro level and Town planning schemes is a Micro level planning
- Land Reconstitution- Large chunk of land can be acquired for public purpose through reconstitution of land
- neighbourhood Level Road Network
- Local Level Infrastructure Implementation
- Costs are distributed; all owners loose same proportion of land; Benefits are shared
- Public inputs are sought; grievances are redressed



Before TP Scheme



After TP Scheme

12.6.3.1 Public- Private Partnership for Road Infrastructure Development – Ahmedabad

Sardar Patel ring road in Ahmedabad demonstrates how PPP models can be used effectively for city Infrastructure development. AUDA has managed to implement a project of such large scale in a brief period of time and set an example for other Development Authorities and ULBs to replicate this success story. Ahmedabad Urban development Authority (AUDA) has developed BOT model to carry out Phase-II development of Ring road.

Private Sector was involved for all technical inputs from initial stage of the project including Planning, technical and financial feasibility studies, surveys, detailed design, construction, supervision and construction quality control to achieve efficiency.

Private participation was involved for following work:

- Junction development
- Plantation along the road
- Toll tax collection
- Signage development

BOT Model use for Ring road:

BOT model shows an integrated partnership between AUDA and the private party, enabling AUDA to transfer responsibility of design, procurement, construction, operation and maintenance of the road and its facilities to the private party.

The private company generates revenue by collecting fees in the form of toll tax from people using the ring road during the operation and maintenance period.

Key Learning's:

- A participatory approach results in creation of urban infrastructure in a rapid and efficient manner.
- Professional approach to planning and implementation of infrastructure projects.
- Land development through TP scheme leads to an equitable and easy mechanism to acquire land for infrastructure project.

**12.6.3.2 Public- Private Partnership (PPP) For Affordable Housing- Rajasthan**

Public private Partnership (PPP) is merging as an efficient model for delivery of services across various sectors. The concept of PPP in housing sector has evolved widely in order to meet large demand of housing.

PPP approach allows state agencies to overcome resource deficit, improve cost recovery and increase supply of houses based on demand. The public sector owns controls and regulates the use of land which is the most valuable resource for any housing project.

New Initiatives was launched under the affordable Housing Policy, 2009 for using PPP model in Rajasthan. Different PPP models were adopted for meeting the emerging housing demand.

Model: 1 Mandatory Provision

- Private developers to reserve 15% of the dwelling units or 5% of the residential area whichever is higher to be used for EWS/LIG housing in each of their township/Group Housing schemes

Model: 2 Private Developers on Private Land

- Developer to construct G+3 EWS / LIG flats on 25-40% land owned by him
- These flats should be handed over to Govt. at pre-determined price
- Developer gets additional FAR, twice the permissible limit on entire plot
- Additional FAR can be utilised on remaining plot area or exchanged for TDR
- Waiver of EDC, Plan approval fees, Conversion charges; lower stamp duty

Model: 3 Private Developers on Acquired Land

- Selected developer can take up construction of EWS/LIG/MIG-A flats on the land
- acquired by ULBs
- Land would be made available to developer on payment of compensation
- (Land acquisition cost + 10% Administration charges)

Model: 4 Private Developers on Government Land

- Government land to be offered free of cost to the developer to be selected through an open bidding process
- Developer offering maximum number of EWS/LIG flats, free of cost to the ULB would be awarded the project. At least 50% houses should be of EWS category
- Developer shall be free to use the remaining land as per his choice for residential purpose with 10% of commercial use.

Various incentives to Developers are as follows:

- FAR- Double the permissible Floor Area Ratio
- Complete waiver of external Development Charges, Building Plan Approval Fees, Conversion charges & reduction in stamp duty
- Commercial use upto 10% of plot area
- Fast track approval of the project within 30 days
- Buy back of flats by nodal agency of the government at predetermined prices

Key Learning's:

- Shortage of affordable housing is emerging as a major challenge for the government, which can be tackled through a series of measures and policy guidelines
- Joint approach brings together the technical and managerial expertise of the private sector with the accountability and fair pricing of the public sector to improve the housing delivery.

12.7 RECOMMENDATIONS & PLANNING POLICY

12.7.1 IMPORTANCE OF PLANNING POLICY GUIDELINES

It is necessary to create an appropriate policy framework for transfer of Government Land to Development Authorities, allotment of land and properties by Development Authorities, establishment of Master Plan Infrastructure Development Fund and institutional mechanism required for implementation of Master Plan proposals and regulatory framework in an effective and efficient manner.

Master Plan of a city and surrounding areas is usually the guiding force for Urbanization. In context of Dibrugarh, it is the DMP, the statutory document for guiding the process of Urbanization of larger urban areas. The DMP creates a long-term vision for development of a city and peripheral areas and provides frame work for organized Urban Development.

The present system of implementation of DMP lacks coordination and an integrated mechanism, which has thrown up following challenges. Firstly, the process of Urbanization requires vacant lands, both government and private, to be developed for the purpose of urban settlements through the process of land assembly and planning. This process should be equitable, effective, and efficient and time bound. In absence of Policy tools like Transferable Development Rights (TDRs), land pooling mechanisms etc., optimum results could not been achieved. Secondly, to roll out all projects contained in DMP, mobilization of financial resources at unprecedented level is required. Successful DMP implementation will require seamless coordination between land allotment, assembly, management, planning and development activities. the task of building and expanding a city to the projected population will require involvement of multiple stakeholders including various departments of Government; therefore, same requires an effective Institutional Mechanism for steering and guiding the process. The challenge of environmentally sustainable and climate proofing of the development needs to be addressed by developing regulatory mechanisms for protection of waterbodies, canals, river, Sustainable Urban Transport strategies through Transit Oriented Development etc.

12.7.2 GENERAL ISSUES ASSOCIATED WITH INDIAN CITIES RELATED TO PLANNING POLICY

The growth of India's urban population has not been accompanied with proportionate increases in urban infrastructure and service delivery capabilities. Cities in India face a range of challenges to meet demand and supply gaps in urban regions, in such areas as water, waste management, energy, mobility, the built environment, education, healthcare and safety. The challenges may exacerbate further if timely and adequate action is not taken. The concept of a planned urban administration is yet to be addressed in India's cities and severe supply and demand gaps are driving cities towards a planned approach to tackle urbanization. Piecemeal efforts have been made but they lack the thrust to address mega issues. Urban India faces challenges across sectors, with some requiring immediate attention and others requiring long-term action.

Rapid urbanization in India has led to increased demands for providing state-of-art infrastructure in Urban Local Bodies (ULBs) and the ULBs are continually looking for new sources of funds in order to meet the requirements of creating and upgrading infrastructure. ULBs have to play a crucial role in implementing the urban rejuvenation programmes, but they lack the resources to execute the programmes. Inadequate institutional capacity, inadequate revenues, a lack of collaboration between multiple planning and administration bodies lead to improper implementation of planning policies. Such issues for are described below.

Poor collaboration among Planning and Administrative Bodies

The urban governance structure is fragmented in India. At one end of the spectrum lie such cities as Ahmedabad, in which the ULB provides all services, and at the other end are cities such as Bangalore, in

which over 10 agencies are involved in providing urban services. Agencies involved in the planning and administration include ULBs, parastatals, state government agencies and development authorities, among others. With each agency under a different leader, the goals of the agencies are often unaligned, which leads the city to operate in siloes.

Insufficient Capacity

The institutional challenges create a vicious cycle. The inadequate resources coupled with a poor governance structure and archaic processes result in inadequate and low-quality service delivery. Such service delivery attracts lower user charges and compliance that further degrades urban governance and finance.

Inadequate Revenue Base

The ULBs are thus constrained in the absence of funding sources for urban development projects. The major source of revenue for urban local governments are property taxes and user charges but low charge out rates and poor compliance in the payment of charges and taxes have led to financial dependence on the state government.

With declining sources of revenue, local governments must seek funds from the state governments even to fund operational expenses such as the salaries of employees.

Promoting Public-Private Policy Frameworks

PPPs for urban development have had mixed results in India. Urban rejuvenation programmes have encouraged private-sector participation but the following issues must be resolved to attract the best firms:

- Project funding is a challenge with low user charges and insufficient other value capture mechanisms. Although ULBs are not financially independent, they must make projects financially viable through adequate funding mechanisms.
- The sharing of risks in public-private partnership projects has often been suboptimal with revenue risk often passed on to the private sector.
- Government agencies have limited capacity to perform the preparatory work required to develop projects appropriately. The lack of time to ensure good-quality project development could result in reduced private sector interest, mispricing, cost escalation or delays in execution.
- Outstanding and delayed payments to the private sector have resulted in a loss of confidence, aggravated by long-standing disputes.

12.7.3 APPROACH ADOPTED TO DERIVE PLANNING POLICY

To derive the planning policy, certain approach was adopted. The first step was to collect the primary data and secondary data for the planning area. For obtaining Primary data, Household survey as well as Transportation survey was conducted. Apart from these, interaction with government officials, institutions, NGOs, various stakeholders were held to understand strengths, weaknesses, opportunities and threats for the planning area. Secondary data for Demography, Environment, Heritage, Tourism, Economic base, Physical Infrastructure, Social Infrastructure, Housing, Traffic & Transportation etc. were collected from various government departments. The satellite imagery was procured from NRSC, Hyderabad to generate scientific base map. Village wise cadastral maps, Town Survey Sheets, FMB sketches were also procured to be the part of seamless base map. Existing land Use survey was conducted to earmark accurate existing land use on base map.

Simultaneously, analysis for demography, economy, Physical Infrastructure including water supply, sewage, solid waste management and drainage, Social Infrastructure including education, health, recreation,

government organisation etc., Heritage & Tourism, Traffic & Transportation, Housing, Environment were carried out. Considering the population growth in the study region, village level analysis was done to understand the urbanisation pattern. Last four decades for the villages were analysed along with availability of physical as well as social infrastructure. All the existing available infrastructure facilities based on primary and secondary survey were analysed. After thorough analysis and clear understanding, the policies proposed by Government of India were also studied and incorporated according to the study region.

After analysing village level situation of planning area, consulting various stakeholders, options and strategies for planning area are derived. Growth Centres, Growth Points and Transit nodes were identified based on the analysis carried out to give the proposal for future development. Based on the Growth Centres, Growth Points and Transit nodes, circulation pattern of the planning area is proposed with proper hierarchy of roads. The land use based proposals are given at three levels such as overall Dibrugarh planning area, conurbation area and rural area. Various government projects such as AMRUT, CIDF (City Infrastructure Development Fund) are incorporated in the proposal of DMP 2045.

By looking into the issues for implementing planning policy for Dibrugarh such as multiple disciplines for development works, lack of proper coordination among government departments etc., the planning policy for implementation of Traffic & Transportation proposals, Proposals of Public & Semi Public uses, proposals of Environment preservation, to develop affordable housing in planning area, for heritage conservation and for various development projects are derived.

12.7.4 PLANNING POLICY

12.7.4.1 Planning Policy for implementation of Traffic & Transportation Proposals

To derive the planning policy for implementation of traffic & transportation proposals, issues of this sector should be kept in to consideration. Key issues found across the planning area are not upto the mark designed intersections, lack of road hierarchy, absences of dedicated sufficient parking space around key institutions & nodes, bottlenecks along major roads and pedestrian traffic conflict issues.

By looking into the future demand for the roads for the projected population, the roads proposed for widening are proposed in such a way that it minimizes disturbances to the surrounding plot owners. The road widening is proposed within the DMB with maximum possible manner. The new linkages are proposed wherever the missing links are identified. It is also proposed in such a manner that it does not disturb surrounding settlement. The proposals for road widening and new linkages are described in detail in chapter 7.13. Peripheral outer ring road and missing link roads are proposed to connect the different enclaves to avoid the haphazard traffic flow of Dibrugarh region. These proposed roads are identified and studied extensively on the ground, analyzed and verified such that the maximum length of the roads falls under the jurisdiction of Government of Dibrugarh. To enhance the orderly growth through the transportation network system TOD concepts is also applied to have the sustainable development in the study region. Proposals of Public Transportation, Transit nodes, road widening proposals, proposal for new linkages are derived after Transport study. Parking locations are identified in DMB area to manage the traffic congestion within core area.

The other proposals of Traffic & Transportation sector such as transit nodes should be implemented through Land acquisition under the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (LARR). The proposals of road widening, new linkages and parking are to be implemented through the said act.

12.7.4.2 Planning Policy for implementation of Public & Semi-Public uses

To derive the planning policy for implementation of proposals of Public & Semi Public uses, issues of this sector should be kept in to consideration. Looking in to the broader level, Dibrugarh Planning Area is having sufficient educational and healthcare facilities. Dibrugarh University, Assam Medical College and Hospital, DHS Kanoi College, ITI Dibrugarh, S.D Sahewalla Memorial School of Nursing and Gyan Vigyan Acedemy etc. are very renowned institutions of District level existing in Dibrugarh. The villages of the planning area are also having sufficient health and educational facilities. For the future requirement of the projected population, Public & Semi Public land uses are proposed in planning area.

The Public & Semi Public land uses are proposed on Government Land for easy implementation of public services. This will minimize the hurdles faced during land transaction. As Public & Semi Public land uses are proposed on Government Land, it will be executed at a faster rate. For proposals earmarked over private land, concerned authority such as Education Department, Health Department, PWD, Police Department, Fire Department etc. can take the land on lease and develop it for the public purpose.

12.7.4.3 Planning Policy for implementation of Environmental proposals

To derive the planning policy for implementation of environmental proposals, issues of this sector should be kept in to consideration. From the Existing Land use survey, it was observed that the Water bodies of planning area are deteriorating due to various reasons like encroachments around water bodies, solid waste dumping, disposal of untreated wastewater etc. Brahmaputra, Sessa and Burhi Dihing river are some of the important waterbodies which supports for the drinking and agricultural purposes in the system. But due to the rapid urbanization and pressure on the real estate, it is also observed that there is disturbance in the interconnectivity of channels which leads to the deterioration of the waterbodies. Apart from this, the natural drainage pattern of the town is disturbed by anthropogenic activities viz. encroachment on the drains/waterbodies, dumping of solid waste, disposal of untreated wastewater etc in DTP Drain, Chenglijan and Rajabheta Drain. As a result, various issues arise, like flooding, drying of water bodies, water logging etc. These issues can be addressed by providing buffer area on both the sides of the canals. This buffer area would also help us to maintain the canals without any hindrances. Apart from this, due to rapid urbanization, land under agricultural activities are decreasing. Decline in land under agriculture is to be controlled in such areas of the planning area.

Hence, the buffers are proposed around water bodies within conurbation area and outside conurbation area. Canals and rivers are also proposed to be protected with conservation buffers. Such buffers are mentioned below:

Table 252 Proposed buffer around waterbody

Sr. No.	Particulars	Proposed Buffer
1.	Cheglijan Drain	20m
2.	Maijan Lake	20m
3.	Burhi Dihing River	30m
4.	Sessa River	50m
5.	Brahmaputra River	50m

There is a lack of green spaces/recreational area in the planning area. Thus, after the detail study the city level and neighbourhood level parks/playgrounds are proposed. Bhurbhuri Gaon 3 and Timona Gaon are known as the Rice bowl of the planning area. Hence, it is imperative to preserve this rich and fertile agricultural land. This area is preserved by declaring dedicated agriculture zone under DMP – 2045 and Regulated Development will be allowed in certain parts of this area. Untreated wastewater/industrial effluent

should not be allowed to discharge in any natural drains/waterbodies. Underground sewerage network has to be provided with adequate sewage treatment facilities.

The land belongs to such buffer area should be developed under strict regulations. Strict monitoring for the implementation of buffer area should be followed. Regulated development with special permission from DDA will be allowed in such buffer areas. Existing structures in the buffer areas shall remain as it is. Permission for redevelopment on site of existing structures or renewal may be obtained from DDA. Permission for any new development may be obtained from DDA in consultation with T&CPD, Dibrugarh.

12.7.4.4 Planning Policy for implementation of Affordable Housing in planning area

Owning a house is considered a big issue in today's societies. As such, an exact measure of housing affordability is essential to ensure the need for shelter. Housing is the basic human needs; it is also one of the most important components of urban economic development in any country. In addition, the socioeconomic stability of a country is always depending on the housing affordability of the country. For this reason, housing is a valuable asset that always has a great impact on societal wellbeing. Housing affordability became greater focus in every society; and the affordability problem with regard to housing market is one of the most controversial issues within most developed and developing countries.

It is observed that the price of all kind of housing have been increasing exorbitantly, which indicate that the investment in housing sector is unable to match pace with the increasing demand for housing. Given the importance of housing, there are several issues which need to be tackled to promote the provision of this basic need in Dibrugarh. Rapid urbanization and rural to urban migration has led to a substantial shortage of housing in the region. The direct result of this is the concentration of informal settlements in the city. Given that the shortage in housing is concentrated at the bottom of the pyramid, the sector can play an important role in the socio-economic development.

Moreover, with the rapid urbanization and significant increase in the housing demand, housing sector is considered to be the Engine of immense potential giving a push to the economy because of its link with the employment generation and livelihood. Therefore, provision of housing can make a significant difference in income of families, both in rural and urban areas.

Public Housing in Singapore – a successful model

Today, more than 80% of Singapore's population is living in public flats, with 93% of them owning their flats. Because of this, the public housing model of Singapore is considered as one of the most successful examples of affordable housing models in the world. The Housing and Development Board (HDB) is Singapore's public housing authority and a statutory board under the Ministry of National Development. As Singapore's sole housing agency, the HDB is unique in its organizational structure, function, and approach to housing. It operates like a single, comprehensive source for housing development and coordinates planning, land acquisition, construction, financing, and policy for housing in Singapore. By centralizing its public housing effort, Singapore has avoided the problems of government silos and fragmentation of duties that are associated with multi-agency implementation.

The unique aspect of Singapore's housing model is that emphasis is on ownership rather than rental. Affordability is ensured through a set of modalities, including the provision of different unit sizes, progressive mortgage payments (based on income levels), low interest rates and government subsidies. For example, government subsidizes low-income groups and first-time buyers for buying houses. Till date, HDB has developed more than 900,000 flats in Singapore, which have been given to Singaporeans.

Housing for All by 2022 – A National Mission

In June 2015, the Union Cabinet chaired by the Prime Minister gave its approval to the "Housing for All by 2022" - National Mission for Urban Housing to address the issue of affordable housing in urban areas. National Urban Housing Mission seeks to meet the gap in urban housing units by 2022 through increased private sector participation and active involvement of the States. It has four broad components or verticals out of which credit linked subsidy would be implemented as a Central Sector Scheme and not a Centrally Sponsored Scheme.

a) Slum rehabilitation of Slum Dwellers with participation of private developers using land as a resource

- The Centre would provide a grant of INR 1 lakh per house to the state for deployment in the development of any slum rehabilitation project

b) Promotion of affordable housing for weaker section through credit linked subsidy - An interest subsidy of 6.5% on housing loans will be provided to EWS/LIG categories, which can be availed upto a tenure of 15 years.

c) Affordable housing in partnership with Public & Private sectors - Central assistance at the rate of INR 1.5 lakh per house for the EWS category will be provided.

d) Subsidy for beneficiary-led individual house construction or enhancement- Central assistance at the rate of INR 1.5 lakh per house for the EWS category will be provided

12.7.4.5 Planning Policy for Heritage conservation

The heritage buildings in the core city area are being converted in to modern style building which lead them to loss of heritage value of the French rule. These buildings must be preserved as it is as they are with the great heritage importance. The heritage conservation in Core city area can be done through Transfer of Development Rights (TDRs). TDRs are given for preservation of heritage landmark buildings and is a way to compensate the property owners for loss in revenue on their properties. Transfer of Development Rights (TDR) is a zoning technique used to permanently protect cultural resources by redirecting development that would otherwise occur on these resource lands to areas planned to accommodate growth and development.

Transfer of Development Rights programs enable landowners within cultural resource areas to be financially compensated for choosing not to develop some or all of their lands. These landowners are given an option under municipal zoning to legally sever the "development rights" from their land and sell these rights to another landowner or a real estate developer for use at another location.

The land from which the development rights have been severed is permanently protected through a conservation easement or other appropriate form of restrictive covenant, and the development value of the land where the transferred development rights are applied is enhanced by allowing for new or special uses, greater density or intensity, or other regulatory flexibility that zoning without the TDR option would not have permitted.

Establishing a TDR program involves the following basic steps:

- Establish the TDR option and administrative provisions. Use of TDRs must be established as a voluntary option.
- Establish the area of high resource conservation value
- Determine the number of TDRs allocated to each landowner within the high resource conservation area (usually a simple mathematical formula – e.g., one TDR for every five (5) acres)
- Establish the procedure for severance of TDRs

- Provision of the use of a Deed of Transferable Development Rights document
- Establish the procedure for conservation of heritage buildings
- Establish the receiving area (area or areas planned to accommodate growth). Potential receiving areas can be residential, commercial, industrial, or institutional in character, or any combination thereof.

12.7.4.6 Framework for application of Value Capture Finance (VCF) methods to projects

VCF seeks to enable States and city governments raise resources by tapping a share of increase in value of land and other properties like buildings resulting from public investments and policy initiatives, in the identified area of influence.

The different instruments of VCF are; Land Value Tax, Fee for changing land use, Betterment levy, Development charges, Transfer of Development Rights, Premium on relaxation of Floor Space Index and Floor Area Ratio, Vacant Land Tax, Tax Increment Financing, Zoning relaxation for land acquisition and Land Pooling System.

Some Indian cities through state urban regulations have been developing and exercising some of VCF mechanisms – The Mumbai Metropolitan Region Development Authority (MMRDA) and City and Industrial Development Corporation Limited (CIDCO) have used different Value Capture methods including Betterment levy to finance infrastructure development in the urbanizing areas. Tamilnadu and Maharashtra have made Land Value Tax applicable to urban areas too under which increase in land value is tapped through increased revenue tax. West Bengal has formulated a system to capture gains from land use conversion. Area based Development charges are being resorted to in Andhra Pradesh, Gujarat, Maharashtra, Tamilnadu and Madhya Pradesh. Karnataka, Gujarat and Maharashtra have made enabling provisions for enabling Transfer of Development Rights to buy additional FSI/FAR.

Value Capture Methods

- **Land Value tax** – considered the most ideal value capture tool which apart from capturing any value increment, helps stabilize property price, discourage speculative investments and is considered to be most efficient among all value capture methods. Maharashtra and Tamilnadu, through state laws have expanded the scope of this mechanism to cover urban land also. Globally, land value tax is widely used in Denmark, Australia and New Zealand.
- **Fees for changing Land use (agriculture to non-agriculture)** – land revenue codes provide for procedures to obtain permission for conversion of land use from agriculture to nonagricultural use.
- **Betterment levy** – one-time upfront charge on the land value gain caused by public infrastructure investment.
- Impact fees are the fees levied from the owners with illegal construction to get them converted into authorized development.
- **Vacant Land Tax (VLT)** — applicable on those landowners who have not yet initiated construction on their lands. In Andhra Pradesh, the Greater Hyderabad Municipal Corporation (GHMC) imposes a tax of 0.5% of the registration value of the land if not used exclusively for agriculture purpose or is vacant without a building.
- **Tax Increment Financing (TIF)** — one of the most popular Value Capture tools in many developed countries, especially the United States. In TIF, the incremental revenues from future increases in property tax or a surcharge on the existing property tax rate is ring-fenced for a defined period to finance some new investment in the designated area. Tax Increment Financing tools are especially useful to finance new investments in existing habitations. Some of the Smart City Proposals have planned for TIF in their

area-based developments (ABD).

- **Land pooling System (LPS)** — a form of land procurement where all land parcels in an area are pooled, converted into a layout, infrastructure developed, and a share of the land, in proportion to original ownership, returned as reconstituted parcels. In India, States such as Gujarat and Haryana have used land assembly programs where the owners agree to exchange their barren lands for infrastructure-serviced smaller plots. Gujarat has used these tools to guide the development of Ahmedabad city and its surrounding infrastructure.

Framework for application of VCF methods to projects

Project initiation - At the time of initiation of the project the rules and regulations governing Value Capture in the Union Territory need to be studied and possibilities.

Planning - The area of influence of the project will be the area in which land and property values are expected to increase due to project location. The starting point is the value impact assessment in the area of influence, which should form a part of the Detailed Project Report (DPR). Next, stakeholders who will benefit from the setting up of the project will have to be identified and consultations held with them right from the stage of project initiation.

Design and Strategy - The Value Capture methods for funding project need to be identified and these methods have to be put in place by the State Governments. This will include the type and number of VCF tools to be applied, methods of assessing, levying and collecting the incremental value generated, time period during which the VCF tools will be in operation, etc.

Execution and Operation - The value capture method for the project should be implemented and an efficient mechanism for monitoring of fund management put in place. Regular monitoring and evaluation of the project progress will have to be established and put in the public domain. Figure below gives the details of the steps to be taken by the Central/State Governments and their agencies at the time of doing project feasibility studies.

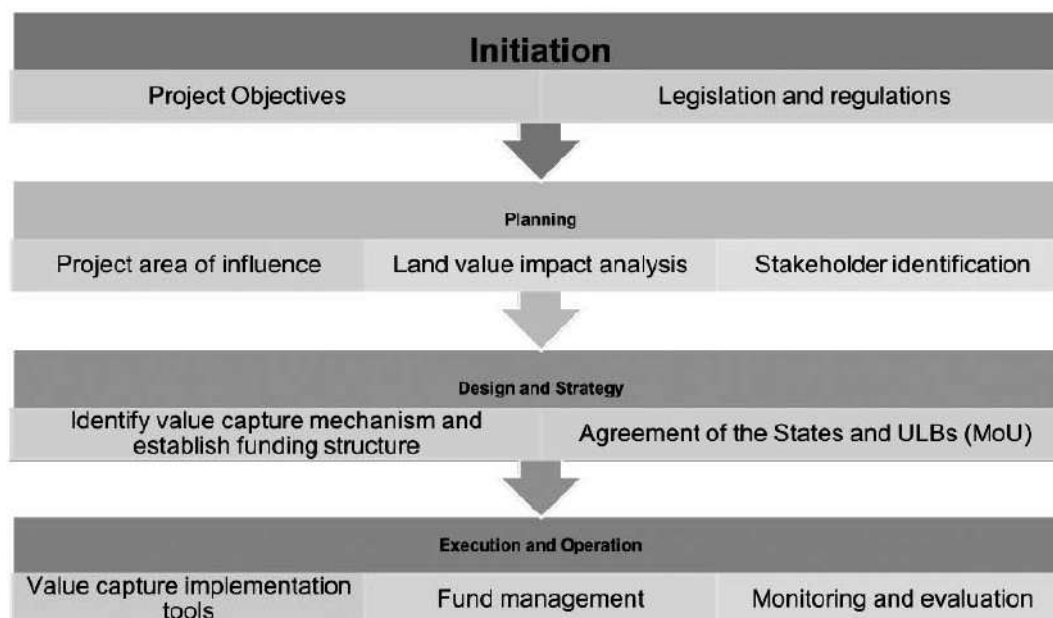


Figure 189 Steps required for Project based VCF policy framework

12.8 URBAN DESIGN GUIDELINES

Urban design is the discipline through which planning and architecture can create or renew a sense of local pride and identity. It has great potential for enhancing the visual image and quality of Neighbourhoods by providing a three-dimensional physical form to policies described in a comprehensive plan. Urban design is process of giving shape to built environment which may address group of buildings of specific character, important streets public spaces etc. This will make urban areas functional, more attractive and sustainable. It focuses on design of the public realm, which is created by both public spaces and the buildings that define them. Urban design is done at various scales viz. at macro scale of urban structure in terms of planning/ zoning, transportation and infrastructure networks to the micro scale in terms of street furniture, lighting etc. This section deals with urban design guidelines for certain important areas viz. core area of city, areas with environmental significance, special heritage areas etc. These guidelines direct the process of revitalization, planning, design and management of such areas.

12.8.1 KEY CONSIDERATIONS FOR ENTIRE DMPA 2045

Few considerations are stated below which are essential to arrive at a basis for formulating Urban Design guidelines for urban fabric:

Design Places for People: To make urban places more functional and acceptable these places must be safe, comfortable, vibrant, varied attractive and distinctive.

Design to Enrich Existing context: To enrich qualities and context of existing urban places. This means encouraging a distinctive response that arises from and complements its setting and applies at every scale region, city, town, neighbourhood and street.

Design to enhance accessibility: To make places easily accessible and which are well integrated physically and visually with its surroundings.

Work with Landscape: Design should be such as to strike a balance between natural and manmade environment and utilize each intrinsic resource and character viz. climate, landform, landscape and ecology

Design with Usage of Mixed Forms: Stimulating, enjoyable and convenient places meet a variety of demands from the widest possible range of users and social groups. The design element should weave together different building forms, uses and densities.

Economic Viability: For projects to be, developable and well cared for, they must be economically viable, well managed and maintained. This means understanding the market considerations of developers, ensuring long-term commitment from the community and the local authority, defining appropriate delivery mechanisms and seeing this as part of the design process.

Design for Change: Design needs to be flexible enough to respond and adapt to future changes in use, lifestyle and demography. This means designing for energy and resource efficiency; creating flexibility in the use of property, public spaces and the service infrastructure and introducing new approaches to transportation, traffic management and parking.

12.8.1.1 Vision

To guide physical development towards a desired scale and character that is consistent with the social, economic and aesthetic values of the City.

12.8.1.2 Urban Design Objectives

- To ensure that new development makes a positive contribution to sustainability and the urban fabric
- To enhance and protect the landscape qualities
- To enrich the distinct topographic and landscape qualities and characteristics of the town
- To ensure that all development responds positively to the existing patterns of urban form and character, the landscape qualities, historic and cultural elements and social dimensions and aspirations of the town.
- To reinforce the structure and image of the town as an attractive place to live, do business, recreate and as a tourist attraction.
- To ensure that the declared arterial network of transport and movement corridors makes a positive contribution to town's image.

12.8.1.3 Components of Urban Design

The following aspects need to be considered to arrive at the basis for policies affecting the urban fabric:

- Areas of significance in built environment.
- Visual integration of the city.
- Policy for tall buildings.
- Policy on unhindered access movement, parking and pedestrian realm.
- Policy on Hoardings, Street furniture and Signage.
- Urban Design Scheme.
- Policy for design of pedestrian realm.
- City structure plan and Urban Design objective.
- Policy for conservation of Heritage Precincts Buildings and Zones.

12.8.1.4 Significant Areas of Built Environment

In DMP, following significant areas are identified that needs special urban design consideration.

- New Housing/ neighbourhood development
- Waterfront Development – Brahmaputra River
- Heritage Development
- City Gateways
- Streetscapes

New Housing Schemes/ NEIGHBOURHOOD Development**Built Character:**

Group Housing is a cluster or group of attached homes around common lawns, gardens, or play areas. Such areas should provide residents with both private and common outdoor spaces. These common spaces can also foster social interaction amongst residents, between residents of Group Housing. This should be designed to maintain a sense of privacy yet to allow for interaction between neighbors. Yards and entry courtyards when abutting a street or common space should be separated through physical elements such as open or low fencing, screens, and low hedges or walls.

If pocket park areas are provided, they should reflect character of neighbourhood and contain elements such as lawn, children's play areas etc. When a Group Housing area is enclosed by neighbourhood scale streets, multiple perimeter or street corner gardens may connect multifamily residents with the surrounding neighbourhood better than internalized common space. If feasible these common spaces should be easily observable from unit windows. These common spaces share common area supervision responsibilities among a close-knit group of neighbors.

Category of Development

High rise low density The category is defined by the development where there is more of a marginal space between highrise buildings in form of pedestrianisation, recreational spaces, buffers etc. This kind of development shall be reviewed as Low density because per person to space ratio comparatively is higher.

High rise High density The category is defined by the development where there is a little marginal space between high-rise buildings. This kind of development shall be reviewed as high density because per person to space ratio is comparatively lower.

Low rise low density The category is defined by the development where there is more marginal space between low-rise buildings. This kind of development shall be reviewed as Low density because per person to space ratio is comparatively high.

Low rise High Density The category is defined by the development where there is a little marginal space between low-rise buildings. This kind of development shall be reviewed as high density because per person to space ratio is comparatively low.

Following needs to be encouraged:

- For new Residential Development create edge or boundary conditions in neighbourhood for creating a sense of enclosure
- Buildings along the street compatible with other neighbourhood types in the immediate vicinity.
- Buildings which harmonize with the surrounding neighbourhood.
- Parking areas removed from primary pedestrian zones.
- Cluster of houses around a common open space with appropriate landscaping. Following needs to be discouraged:
- Buildings that don't relate physically or visually to adjacent shared spaces.

Circulation

The vehicular circulation system generally includes internal circulation drives with parking areas. Important streets should be enhanced with streetscapes and sidewalks. The experience of moving on these roads can be enhanced through use of various elements such as street lighting, roadside plantation, and development of important Junctions etc. Pedestrian circulation should be promoted through provision of walkways and direct connections to adjacent streets.

- For important routes being used by Tourists, devices such as information kiosks, directional signs and maps can be used to help tourists easily locate their destinations.
- For major roads, individual road solutions shall be given to complement abutting land uses with controlled densities, roadside plantation etc.
- Neighbourhood streets should be designed to provide safe and convenient access for vehicles and pedestrians and to relate to the type of neighbourhood and uses through which the streets travel. They

should provide safe and attractive designs including composition of street landscaping with sidewalks/ paths. neighbourhood streets can provide a visual experience and lower the speed of local traffic by aligning with a neighbourhood focal point such as a park, a fountain or a sculpture.

- Street patterns should interconnect and encourage easy access from one neighbourhood to another & also discourage high speed travel. Individual streets should maintain adequate travel ways for emergency and service vehicle access.

Following needs to be encouraged:

- Destination assistance devices such as information kiosks, and directional signs for tourists.
- Roads relating to a neighbourhood focal point such as a street passing by a pocket park, terminating at a vista point, or interrupted by a fountain.
- Visual screening of parking areas.
- Contiguous pedestrian routes.
- Interconnected but low speed neighbourhood streets.
- Landscaping in the right of way that relates to the adjacent uses.
- Perimeter road patterns compatible with the adjacent neighbourhood street system.
- Low speed traffic techniques such as intersection at focal points.

Following needs to be discouraged:

- Parking areas located between buildings and pedestrian oriented streets.
- Pedestrian circulation patterns that discourage walking to neighbors or community destinations.
- Random curvilinear streets.

Landscaping

Landscaping should be used to soften the mass of buildings and to provide usable common space for residents. The use of elements such as evergreen groundcover and small shrubs around common spaces can add variety and delineate boundaries while allowing for surveillance. When hard surfaces are predominant feature, visual relief and interest can be provided through use of plantations such as plants with flowers and special interest plants. Common park space should be located so that it is visible to residents and accommodate a variety of activities for differing age groups.

Following needs to be encouraged:

- Trees that provide year-round visual interest such as evergreen groundcover & hardy landscaping plantings.
- Landscaping solutions such as parks/gardens in large open areas which add depth and space.
- Elements such as low walls, fences, screens, or hedges to delineate outdoor spaces.
- Adequate use of garden lighting to accentuate landscaping and pathways in the evening.
- An uninterrupted flow of landscaping between buildings and the streets by placing elements
- Abutting streets, trails or common spaces fence styles, such as low or open fences that encourage interaction between private and public spaces.

- Paving solutions for driveways and public walkways that complement the architectural and landscape character of the area such as stone, masonry or concrete.
- Following needs to be discouraged:
- High walls and solid fences adjacent to pathways or shared open space.

12.8.1.5 Water Front Development

There is scope for development of Brahmaputra and Burhi Dihing waterbody using urban design tool, the existing image of these areas can be transferred into a new livable and environmental friendly image. While developing areas near water bodies the following urban design guidelines needs to be considered.

- Development around and adjacent to water bodies in Dibrugarh should be taken up in a sensitive manner.
- Integrated development on lakefronts with the natural environment to preserve and enhance views, and protect areas of natural drainage.
- Minimise grading to maintain the natural topography, while contouring any landform alterations to blend into the natural terrain.
- Screen development adjacent to natural features as appropriate so that development does not appear visually intrusive, or interfere with the experience within the open space system. The provision of enhanced landscaping adjacent to natural features could be used to soften the appearance of or buffer development from the natural features.
- Use building and landscape materials that blend with and do not create visual or other conflicts with the natural environment
- Design and site buildings to permit visual and physical access to the natural features from the public right-of-way.
- Encourage location of entrances and windows in development adjacent to open space to overlook the natural features.
- Protect views from public roadways and parklands to natural canyon, resource areas, and scenic vistas.
- Preserve views and view corridors along and/or into waterfront areas from the public right-of-way by decreasing the heights of buildings
- Provide public pedestrian, bicycle, and equestrian access paths to scenic view points, parklands, and where consistent with resource protection, in natural resource open space areas.
- Provide special consideration to the sensitive environmental design of roadways that traverse natural open space systems to ensure an integrated aesthetic design that respects open space resources. This could include the use of alternative materials such as "quiet pavement" in noise sensitive locations, and bridge or roadway designs that respect the natural environment.
- Special considerations should be given to the appropriate scale, height and disposition of building blocks along the waterfront to avoid blockage of sea/land breezes and prevailing winds.

12.8.1.6 Public Spaces

Public spaces include public plazas, squares or other gathering spaces in each neighbourhood center. neighbourhood centre is a geographically localised community within a larger city, where members of a community tend to gather for group activities, social support, public information, and other purposes. They may sometimes be open for the whole community or for a specialized group within the greater community.

District centers, commercial areas, Public/ Semipublic and Recreational Areas in Master Plan demands Proper Campus Planning and care to maintain the protocol of the city.

Organised Informal Market/Food Plazas

To stop encroachment of all types of Informal markets, Master Plan have provided organized spaces for informal markets, hawkers, handicraft shops etc. these markets will be majorly located in District Centers and Core areas.

The informal and organized sector is a major source of employment in the economic fabric of the city for which the following approach is proposed:

- Earmarking of 'Hawking' and 'No Hawking' Zones at neighbourhood and cluster levels.
- The weekly markets to be identified and planned / developed.
- New areas for informal trade to be developed and integrated with housing, commercial, institutional and industrial areas.
- Provision of common basic services like toilets, water points, etc.
- Institutionalizing designs of stalls, push-carts and mobile vans.
- Design outdoor open areas as "outdoor rooms," developing a hierarchy of usable spaces that create a sense of enclosure using landscape, paving, walls, lighting, and structures.
- Design such markets/ haats to accommodate a variety of artistic, social, cultural, and recreational opportunities including civic gatherings such as festivals, markets, performances, and exhibits.
- Consider artistic, cultural, and social activities unique to the neighbourhood and designed for varying age groups that can be incorporated into the space.
- Use landscape, hardscape, and public art to improve the quality of markets/ haats.
- Encourage the active management and programming of these markets.
- Design outdoor spaces to allow for both shade and the penetration of sunlight.
- Frame parks and plazas with buildings which visually contain and provide natural surveillance into the open space.
- Involvement of NGOs envisaged.
- Address maintenance and programming.

12.8.1.7 City Gateways

Road:

- Non-residential public buildings with pleasing appearance should be located on entry corridors.
- Attractive landscape should be developed in accordance with the highway landscape norms.
- Segregation of goods and passenger vehicles at the entry point through separate lanes to improve the visual environment.

• **Rail:**

- Enhancing visual experience for commuters through appropriate landscape along railway tracks. This can be done by growing colorful plantations along railway corridors, keeping wide grazing lands, mounting flags at the entry of railway stations.
- Reconstruction / redevelopment of existing stations should be undertaken through comprehensive Urban Design schemes.
- Attractive designs should be evolved for new stations.

Air:

- Designing landmarks, nodes, edges of the city in a manner that they can be recognized outstandingly in aerial views. This can be achieved by composing and contrasting scale, color, landscape of structure and boundary with surrounding area.
- Natural and built environment should be revitalized to give an impression of global city.
- The overall green cover in this zone should be enhanced and protected.

12.8.1.8 Streetscape

Hoardings & Signage:

- Hoardings, sign boards, directional boards, bill boards, neon sign bards, balloons, banners etc. have become symbols of present day urban scape and important instruments of outdoor publicity and public information. These, if located properly and aesthetically, may enhance the visual quality of the city. Otherwise, these may cause hazards, obstruction and visual pollution etc.
- Design signage to effectively utilize sign area and complement the character of the structure and setting
- Architecturally integrate signage into design.
- Include pedestrian-oriented signs to acquaint users to various aspects of a development.
- Place signs to direct vehicular and pedestrian circulation.
- Post signs to provide directions and rules of conduct where appropriate behavior control is necessary.
- Design signs to minimize negative visual impacts.
- Address community-specific signage issues in community plans, where needed.
- A major cause for present day chaos on the roads is that the road infrastructure, signage and road markings are not in accordance to the standards laid down by the Motor Vehicle Rules and Highway Code.
- Safety of road users shall be one of the prime consideration while planning / designing of road network

and infrastructure.

- Appropriate road signage and markings are excellent means of educating road users about road safety rules and road discipline and add to the road beautification. These prevent the deviant behaviour of motorists and at the same time provide useful route related information.
- Concerned road owning agencies shall be responsible for installing the appropriate road signage and markings on regular basis.

Street Furniture:

- Public art is an important part of the urban spatial experience, which can be incorporated in the form of functional objects such as street furniture and paving designs.
- Street furniture should be designed sensitively considering the land use, intensity of activity and other identified design districts. Their design must also reflect respect to pedestrians and physically challenged people.
- Access provisions for the physically challenged should be made from the street to overcome curb heights, rain water gratings etc.
- Locate street trees in a manner that does not obstruct ground illumination from streetlights.
- Shade paved areas, especially parking lots.
- Parking spaces close to the entrance should be reserved for physically challenged.
- Exclusive parking bays are proposed near major intersections as part of road R/W with adequate landscaping to provide for parking of mobile repair vans, PCR vans, ambulances, cranes, fire tenders and other public utility vehicles.

Street Frontage:

- Create street frontages with architectural and landscape interest to provide visual appeal to the streetscape and enhance the pedestrian experience.
- Locate buildings on the site so that they reinforce street frontages.
- Relate buildings to existing and planned adjacent uses.
- Ensure that building entries are prominent, visible, and well-located.
- Maintain existing setback patterns, except where community plans call for a change to the existing pattern.
- Establish or maintain tree-lined residential and commercial streets. Neighbourhoods and commercial corridors in the town that contain tree-lined streets present a streetscape that creates a distinctive character.
- Minimize the visual impact of garages, parking and parking portals to the pedestrian and street facades.

Pedestrian Friendly City:

- Major work centres, where large number of pedestrian networks emerge and culminate, should have enhanced facilities for the pedestrians.
- This will lead to more sensitive and intricate design of street furniture, making major image able components part of daily urban experience.

- Design landscape bordering the pedestrian network with new elements, such as a new plant form or material, at a scale and intervals appropriate to the site. This is not intended to discourage a uniform street tree or landscape theme, but to add interest to the streetscape and enhance the pedestrian experience.
- Use effective lighting for vehicular traffic while not overwhelming the quality of pedestrian lighting.
- Pedestrian networks affect spaces in a very distinctive way.
- Establishment of pedestrian networks in any area reveals its vitality.
- They provide richness in terms of spatial experience and community interaction etc.

Transit Integration:

- Provide attractively designed transit stops and stations that are adjacent to active uses, recognizable by the public, and reflect desired neighbourhood character
- Design safe, attractive, accessible, lighted, and convenient pedestrian connections from transit stops and stations to building entrances and street network
- Provide generous rights-of-way for transit, transit stops or stations.
- Locate buildings along transit corridors to allow convenient and direct access to transit stops/stations.

Parking:

- Reduce the amount and visual impact of surface parking lots
- Encourage placement of parking along the rear and sides of street-oriented buildings.
- Avoid blank walls facing onto parking lots by promoting treatments that use colors, materials, landscape, selective openings or other means of creating interest.
- Design clear and attractive pedestrian portico/pathways and signs that link parking and destinations.
- Locate pedestrian pathways in areas where vehicular access is limited.
- Avoid large areas of uninterrupted parking especially adjacent to community public view sheds.
- Build multiple small parking lots in lieu of one large lot.
- Retrofit existing expansive parking lots with street trees, landscape, pedestrian paths, and new building placement.
- Promote the use of pervious surface materials to reduce runoff and infiltrate storm water.
- Use trees and other landscape to provide shade, screening, and filtering of storm water runoff in parking lots.

Utilities:

- Minimize the visual and functional impact of utility systems and equipment on streets, sidewalks, and the public realm.
- Convert overhead utility wires and poles, and overhead structures such as those associated with supplying electric, communication, community antenna television, or similar service to underground.
- Design and locate public and private utility infrastructure, such as phone, cable and communications boxes, transformers, meters, fuel ports, back-flow preventors, ventilation grilles, grease interceptors, irrigation valves, and any similar elements, to be integrated into adjacent development and as inconspicuous as

possible.

- To minimize obstructions, elements in the sidewalk and public right of way should be located in below grade vaults or building recesses that do not encroach on the right of way (to the maximum extent permitted by codes).
- If located in a landscaped setback, they should be as far from the sidewalk as possible, clustered and integrated into the landscape design, and screened from public view with plant and/or fence-like elements.
- Traffic operational features such as streetlights, traffic signals, control boxes, street signs and similar facilities should be located and consolidated on poles, to minimize clutter, improve safety, and maximize public pedestrian access, especially at intersections and sidewalk ramps. Other street utilities such as storm drains and vaults should be carefully located to afford proper placement of the vertical elements.

12.8.1.9 District Centres

A District Centre has been envisaged as a multiple service providing campus, catering to surrounding urban area. The core commercial area such as Wholesale markets, shopping complexes, office buildings, etc. shall be reviewed as a District Centre. The similar definition does not imply to the informal markets but if the informal markets are part of any above category that shall be reviewed and organized in District centre. There are few common components that should be dealt through Urban Design perspective to maintain and enhance the ultimate urban character and image.

1. Landscape
2. Parking
3. Pedestrian Movement
4. Public Spaces
5. Unique Building Character

General Guidelines:

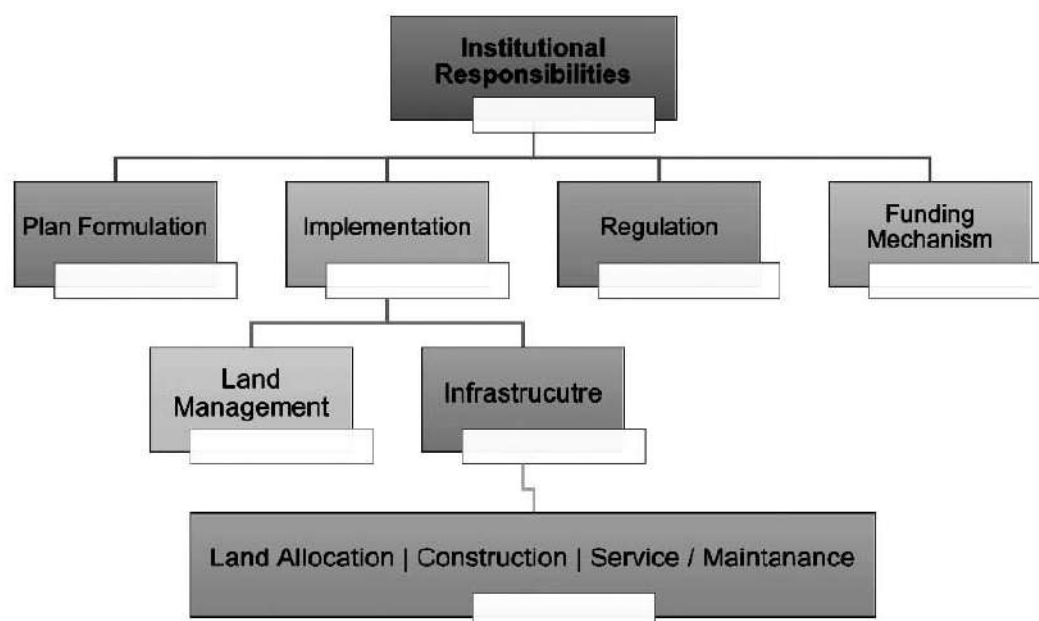
- The area provided for landscape as part of the district centre should weave through the entire district centre to create a pleasant environment.
- Detailed Urban Design and Landscape Schemes should be prepared to integrate Public Transport Terminals, safe pedestrian walkways, parking areas, recreational and cultural areas, etc.
- The envelope, FAR, architectural features of the District Center buildings should be merged with surrounding area.
- A certain percentage of open area should be made mandatory in district center design so that it can be used as recreational area, exhibition purpose or any local festivals.
- Continuity of the sidewalks should be maintained in terms of the width, surface treatment, curb cuts, tree and street furniture locations, for the pedestrians and disabled.
- A district centre should be accessible from the surrounding residential areas through the pedestrian approach or by subways etc. The intermediate public transport should be introduced to increase the mobility within the City Centre.
- An adequate parking should be provided in District Center.
- Provision of common basic services like Public toilets, water points, etc.

- Signage and lighting: for visual accessibility, district center should be provided with proper lighting system and signages. As Dibrugarh is tourist destination, signages in English as well as Hindi should be promoted.
- Use of alternative renewable sources of energy should be encouraged for new buildings (especially those of commercial or institutional nature), traffic signals and public signage, etc
- Planned district centres in city (forming a multi nodal city structure) can be best utilized for creating public spaces and through these, District Centers City will be livelier, inviting and livable.
- As per the proposal of Govt. of India, free wi-fi zones should be provided in order to encourage the Digital India.

13 INSTITUTIONAL FRAMEWORKS

13.1 PROPOSED INSTITUTIONAL FRAMEWORK

Institutional Responsibilities contain Master Plan formulation, effective implementation, strict monitoring of following General Development Regulations and funding mechanism. For effective implementation, available land resource is to be managed very judiciously and infrastructure is to be provided along with proper maintenance from time to time. As mentioned in Chapter 12.6, it is proposed to have Dibrugarh Municipal Board (DMB) with same jurisdiction of Conurbation Area for



obtaining substantial funds from State Government as well as Central Government, which will lead to effective implementation of the Master Plan. For better implementation of Master Plan, responsibilities are to be allocated very judiciously.

The various projects identified for Dibrugarh Master Plan Area (DMPA) and the concerned Government Departments in line with the Vision statement – 2045 for Dibrugarh Planning Area are detailed in Table below.

Table 253 Institutional Framework for Project Implementation

S.N	Location	Project Name	Concerned Department
Urban Development			
1	Core area of Dibrugarh Town	Urban Renewal of Core Old Areas of Dibrugarh Town	DoHUA (T&CP, DDA)
2	Core area of Dibrugarh Town	Development of Heritage Buildings of Dibrugarh Town	DoHUA (T&CP, DDA)
3	Distributed in Town	Rehabilitation of Slums dwellers along Brahmaputra river and on Water Bodies located in Planning Area	DMB, Housing Board
4	Dibrugarh Planning Area	Green Belt around Industrial area and Wetlands	DDA, PWRD, DoHUA (T&CP, DDA)
5	Tingkhong Gaon	Neighbourhood Centre at Ward 15 (9.3 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
6	Subha Chuck Gaon	Neighbourhood centre at Subha Chuck Gaon (9.26 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
7	No. 122 Burahajar Konwar Gaon	Neighbourhood Centre at No. 122 Burahajar Konwar Gaon (7.8 Ha)	Revenue Dept, DoHUA (T&CP, DDA)

8	No. 1 Mancotta	Neighbourhood centre at No. 1 Mancotta (5.08 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
9	Niz Mankatta Gaon (CT)	Neighbourhood Centre at Niz Mankatta Gaon (5.31 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
10	Mohpowalimora Gohain Gaon (OG)	Neighbourhood centre at Mohpowalimora Gohain Gaon (7 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
11	Mahmaripather Gaon	Neighbourhood Centre at Mahmaripather Gaon (8 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
12	Lepetkata Gaon	Neighbourhood centre at Lepetkata Gaon (11.04 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
13	Lekai Gaon	Neighbourhood centre at Lekai Gaon (6 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
14	Konwar Kheroni Gaon	Neighbourhood centre at Konwar Kheroni Gaon (13.4 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
15	Japara Gaon	Neighbourhood centre at Japara Gaon (7 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
16	Hatimura Gaon	Neighbourhood centre at Hatimura Gaon (12 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
17	Hahchora Gaon	Neighbourhood centre at Hahchora Gaon (12 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
18	Ghitira Pather	Neighbourhood centre at Ghitira Pather (6 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
19	Dibruwal Changmai Gaon	Neighbourhood centre at Dibruwal Changmai Gaon (12.56 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
20	Bhurbhuri Gaon No. 3	Neighbourhood centre at Bhurbhuri Gaon No. 3 (12.11 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
21	Chengamari Tekela Gaon	Neighbourhood centre at Chengamari Tekela Gaon (8 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
22	Ward 4	Affordable Housing (2 Ha)	DMB, Revenue Dept, DoHUA (T&CP)
23	Tinsukia Gaon	Affordable Housing (3 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
24	No. 2 Bhurbhuri Gaon	Affordable Housing (9.5 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
25	No. 150 Dibruwal Dihingia Gaon	Affordable Housing (21 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
26	No. 1 Mancotta	Affordable Housing (2 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
27	No 186 Binoi Gutia	Affordable Housing (11 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
28	Mankota 1/159 No. RR (A)pt	Affordable Housing (2 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
29	Mahmaripather Gaon	Affordable Housing (13 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
30	Jokai Region	Affordable Housing (11 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
31	Hatimura Gaon	Affordable Housing (3 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
32	Dewanbari Bengali Gaon	Affordable Housing (5 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
33	Chamoguri Kasari Gaon	Affordable Housing (15 Ha)	Revenue Dept, DoHUA (T&CP, DDA)
Public Semi Public Places			
34	Niz Khanikar	Administrative Block (50 ha)	DoHUA, PWDB
35	Jalan Tea Estate, Convoy Road	International Convention Centre (ICC) (25 ha)	DoHUA (T&CP)
36	Bogpara Gaon	District Library	DoHUA (DDA)
Water Supply System			
37	Dibrugarh Planning Area (DMPA)	Preparation of DPR for Water Supply System for Dibrugarh Planning Area	PHE Dept., DoHUA
38	Existing Dibrugarh Town	Water Supply System sanctioned under AMRUT	PHE Dept., DoHUA
39	Existing Dibrugarh Development Authority Area	Improvement of Water Supply System of Dibrugarh	PHE Dept., DoHUA (DMB, DDA)
40	Dibrugarh Planning Area	Hand Pump water Distribution System	PHE Dept., DoHUA
Power			
41	Existing Dibrugarh Master Plan Area	Renovation and modernization of 33/11 KV and 11 KV / 440 V sub- stations	State Electricity Board, DoHUA

42	Existing Dibrugarh Master Plan Area	Installation of new transformers and capacity augmentation of existing transformers	State Electricity Board, DoHUA
43	Existing Dibrugarh Master Plan Area	Metering of All connections	State Electricity Board
44	Existing Dibrugarh Master Plan Area	Installation of a HVDS (High Voltage Distribution System)	State Electricity Board, DoHUA
45	Dibrugarh Planning Area 2045	Preparation of DPR for Power Supply System for Dibrugarh Planning Area	State Electricity Board, DoHUA

Sewerage System

46	Dibrugarh Planning Area	Preparation of DPR for Sewerage System for Dibrugarh Planning Area	PHE Dept., DoHUA
47	Dibrugarh Planning Area	Laying of Sewer Network for Planning Area	PHE Dept., DoHUA
48	Konwar Handique Gaon	Construction of STP (35 MLD) on 4 Hectare of Land	PHE Dept., DoHUA
49	Dewanbari Bengali Gaon	Construction of STP (35 MLD) on 5 Hectare of Land	PHE Dept., DoHUA
50	Bhurbhuri Gaon No. 3	Construction of STP (35 MLD) on 5 Hectare of Land	PHE Dept., DoHUA
51	Jokai T.E Co. 29/143 ORR	Construction of STP (25 MLD) on 5 Hectare of Land	PHE Dept., DoHUA

Solid Waste Management

52	Dibrugarh Planning Area	Improvement and Modernization of Solid Waste Collection, Transportation and Disposal System of Dibrugarh	DoHUA
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Drainage System

53	Dibrugarh Planning Area	Preparation of DPR for Drainage System for Dibrugarh Planning Area	DoHUA, Water Resource, Revenue Dept.
54	Dibrugarh Town	Cleaning and maintenance of existing main drains	DoHUA, Water Resource, Revenue Dept.
55	Dibrugarh Planning Area	Laying of Roadside drains in new proposed areas within Dibrugarh Planning Area	DoHUA, Water Resource, Revenue Dept., PWDR
56	Dibrugarh Town	Construction and Improvement of Existing Storm Water Drains	DoHUA, Water Resource, Revenue Dept., PWDR
57	Dibrugarh Planning Area	Slope protection, Improvement, Construction, Repair & Restoration	DoHUA, Water Resource, Revenue Dept., PWDR.

Water Bodies

58	Dibrugarh Planning Area	Repair and Renovation of Water Bodies in Planning Area	Revenue and Water Resource Dept., Fisheries, DoHUA
59	Dibrugarh Planning Area	Development of Green Conservation Belt around all water bodies	Revenue, Soil Conservation, DoHUA
60	Dibrugarh Planning Area	Development of Brahmaputra River Front Under Progress (Bank Stabilization Work)	Revenue and Water Resource Dept.
61	Dibrugarh Planning Area	Development of Burhi Dihing river with joggers track as recreational zone	Revenue and Water Resource Dept., DoHUA
62	Dibrugarh Planning Area	Development of water sport complex as recreational zone	Revenue and Water Resource Dept., DoHUA
63	Bhurbhuri Gaon No. 2	Rejuvenation of Kathbil with organized open space	Revenue and Water Resource Dept., DoHUA, Fisheries

Traffic and Transportation

64	Dibrugarh Town	Repair and Renovation of Existing Road Network of Dibrugarh Town	DMB, NHAI, PWRD, NH, NHIDCL
65	Ward 9	Improvement and Conservation of old Dibrugarh Town Railway Stations	Railway Dept., District Administration
66	Tepar Gaon Pathar	Development of Dhamalgaon Railway Station	Railway Dept.
67	Changmai Gorla Gaon	Development of ISBT (26 Ha)	Railway Dept., DoHUA (T&CP, DDA)

68	No. 172 Tepar Gaon Pather	Development of Intermediate Freight Complex (60 Ha)	Revenue Dept., DoHUA (T&CP, DDA)
69	Bairagimath Kachari Gaon	Development of Bus Terminal (14 Ha)	Revenue Dept., DoHUA (T&CP, DDA)
70	Patra Gaon	Development of Bus Terminal (9 Ha)	Revenue Dept., DoHUA (T&CP, DDA)
71	Tinsukia Gaon	Development of Bus Terminal (8.5 Ha)	Revenue Dept., DoHUA (T&CP, DDA)
72	Dhargatoli Gaon	Development of Bus Terminal (7 Ha)	Revenue Dept., DoHUA (T&CP, DDA)
73	Bhurbhuri Gaon No. 3	Development of Bus Terminal (25 Ha)	Revenue Dept., DoHUA (T&CP, DDA)
74	Ward 19	Development of Jalan nagar Bus Terminal	Revenue Dept., DoHUA (T&CP, DDA)
75	Lepetkata Kachari Gaon	Development of Truck Terminal (35 Ha)	Revenue Dept., DoHUA (T&CP, DDA)
76	Bokel Bari Tea Estate	Development of Truck Terminal (10 Ha)	Revenue Dept., DoHUA (T&CP, DDA)
77	Bhurbhuri Gaon No. 3	Development of Truck Terminal (6.25 Ha)	Revenue Dept., DoHUA (T&CP, DDA)
78	Dibrugarh Planning Area	Preparation of DPR on City Mobility Plan	DDA
79	Dibrugarh Planning Area	Construction of City Ring Road	PWD (Roads)
80	Dibrugarh Planning Area	Construction of Outer Ring Road	PWD (Roads)
81	Dibrugarh Planning Area	Improvement of Traffic Signal facility in Dibrugarh Planning Area	DMB, DoHUA (T&CP, DDA)
82	Dibrugarh Planning Area	Augmentation of City Bus Fleet	DMB, DoHUA (T&CP, DDA)
83	Dibrugarh Planning Area	Construction of Non-motorised Transport facilities (Footpaths & Cycle Tracks & Cycle Parking)	DMB, DoHUA (T&CP, DDA)
84	Bairagimath Kachari Gaon	Construction of Cycle parking near Bus stand	DMB, DoHUA (T&CP, DDA)
85	Bairagimath Kachari Gaon	Construction of Multi level Parking at Banipur Railway Station	DMB, DoHUA (T&CP, DDA)
86	Ward 9	Development of Multilevel Car Parking near Town Railway Station	DMB, DoHUA (T&CP, DDA)
87	Ward 6	Development of off- street Car Parking	DMB, DoHUA (T&CP, DDA)
88	Ward 5	Development of off- street Car Parking	DMB, DoHUA (T&CP, DDA)
89	Ward 4, Near Jalan Tea Estate	Construction of off-Street Parking	DMB, DoHUA (T&CP, DDA)
90	Banipur Railway Station	Construction of Road Over Bridge on road near Banipur Railway Station	PWD, Railway
91	Mancotta Road	Construction of Road Over Bridge on Railway Track	PWD, Railway
92	Bypass Road, Khanikar Cross road	Development of Khanikar Fly over on Dibrugarh Bypass Road	PWD (Roads), NH, NHIDCL
93	Bogpara	Development of Bogpara Fly over on Dibrugarh Bypass Road	PWD (Roads), NH, NHIDCL
94	Nh-37, Borboruah Point	Development of Fly over at Borboruah Point towards Bypass road	PWD (Roads), NH, NHIDCL
95	NH-15, Sukafa Point	Development of Fly over at Sukafa Tiniali from Bogibill	PWD (Roads), NH, NHIDCL
Commercial			
96	Bokul Gaon	Development of Commercial/ District Centre (31 Ha)	DoHUA
97	Patra Gaon	Development of Commercial/ District Centre (20 Ha)	DoHUA
98	Chengmari Tekela Gaon	Development of Commercial/ District Centre (15 Ha)	DoHUA
99	Hiloibam Gaon	Development of Integrated Commercial Centre (40 Ha)	DoHUA

100	No. 2 Bhurbhuri Gaon	Development of Integrated Commercial Centre (11 Ha)	DoHUA
101	Ward 4	Development of Vending Zone (2 Ha)	DoHUA (DMB)
102	No 186 Binoi Gutia	Development of Vending Zone (10 Ha)	DoHUA
103	Mohmari Gaon	Development of Vending Zone (8 Ha)	DoHUA
104	Bhurbhuri Gaon No. 3	Development of Vending Zone (14 Ha)	DoHUA
105	Changmai Gorla Gaon	Development of Wholesale and Trade Centre (15 Ha)	DoHUA (T&CP,DDA)
106	Bhurbhuri Gaon No. 3	Development of Wholesale and Trade Centre (10 Ha)	DoHUA (T&CP,DDA)

Social Infrastructure

107	Garudharia Gaon No. 1	Development of Multi-Specialist Intermediate District Hospital (13 Ha)	Health Dept., PWDB
108	Lahowal Chah Bagicha	Development of Multi-Specialist Intermediate District Hospital (14 Ha)	Health Dept., PWDB
109	No 186 Binoi Gutia	Development of Multi-Specialist Intermediate District Hospital (7 Ha)	Health Dept., PWDB
110	Bhurbhuri Gaon No. 3	Development of Health Centre (13 Ha)	Health Dept., PWDB
111	No. 150 Dibrugarh Dihingia Gaon	Development of Health Centre (13 Ha)	Health Dept., PWDB
112	Sapekhati Gaon	Development of Health Centre (11 Ha)	Health Dept., PWDB
113	Bogpara Gaon	Development of Knowledge District (142 Ha)	Education Dept., DoHUA
114	Lekai Gaon	Development of Knowledge District (92 Ha)	Education Dept., DoHUA
115	Hiloibam Gaon	Development of Knowledge District (64 Ha)	Education Dept., DoHUA
116	Sapekhati Gaon	Development of University (80 ha)	Education Dept., DoHUA

Recreational

117	Jokai R.F.	Development of Botanical Garden (18 Ha)	DoHUA, PWD, Forest, Tourism
118	Charbandi Chuk Zarua	Development of District Sport Centre cum Complex (9 Ha)	DoHUA, District Sport Office
119	Lepetkata	Development of District Sport Centre cum Complex (15 Ha)	DoHUA
120	Chota Bogpara	Development of District Level Park (10 Ha)	DoHUA
121	Kushia Khana gaon	Development of Cultural Complex (70 Ha)	DoHUA
122	Niz Khanikar	Development of Science City (20 ha)	DoHUA, Tourism, Education
123	Niz Khanikar	Development of Stadium (10 ha)	DoHUA, District Sport Office
124	Mohmari Gaon	Development of Theme Park (120 ha)	DoHUA, Tourism
125	Near Jokai R.F.	Development of Theme zoo (95 ha)	DoHUA
126	Mohmari Gaon	Development of Exhibition Ground (30Ha)	DoHUA, Tourism, PWD
127	Dibrugarh Planning Area	Development of Water Sport Activity at Burhi Dihing water Body	Water Resource, District Sport Office
128	Hanchora	Development of eco-village tourism at Hanchora	DoHUA, Tourism
129	Dibrugarh Planning Area and Surrounding Region	Development of Spiritual Circuit (Development of Infrastructure at B.Jagannath Temple, Radha Krishna Temple, Maira Mora than, Aai Than, in Dibrugarh Planning Area)	DoHUA, Tourism

Industrial Area

130	Tepor Gaon Pathar and Chnagmari Gohain gaon	Development of Industrial Estate – I (300 Ha)	Revenue, DDA and AIDCL
131	Niz Lahowal	Development of Industrial Estate – II (100 Ha)	Revenue, DDA and AIDCL

13.2 ROLE OF MUNICIPAL CORPORATION IN DMP 2045

Municipal Board will be responsible for operation and maintenance works in water supply, sewerage, storm water drainage, Solid Waste Management, DP & TP roads and street lighting. The other responsibilities are described below:

- The construction, diversion, maintenance and improvement of streets, bridges, squares, gardens, tanks, ghats, wells, channels, drains, latrines and urinals;
- The watering and cleaning of streets;
- Lighting;
- Water-supply;
- Conservancy including sewage disposal;
- Acquiring, keeping and equipping of open spaces for public purposes;
- Planting and preservation of trees;
- Construction of dwelling houses;
- Maintenance and improvement of education;
- Construction and maintenance of hospitals, dispensaries, orphanages, maternity houses, dharmasalas, guest houses etc.;
- Promotion of vaccination;
- Prevention of the spread of dangerous diseases;
- Construction and maintenance of municipal markets and slaughter houses;
- Assistance to public libraries;
- Giving of relief in time of famine, scarcity or any other natural calamity;
- Urban Planning including town planning;
- Disposal of the dead animals or bodies;
- Establishment and maintenance of burial grounds;
- Implementation of the planning in the municipal area as a part of the Development Plan;
- Regulation of slaughter houses and tanneries;
- Fire Services;
- Urban forestry and protection of the environment;
- Safeguarding the interest of the weaker section;
- Slum improvement and up-gradation;
- Promotion of urban amenities; Registration of births and deaths;
- Regulation of slaughter houses and tanneries;
- Adult education and non-formal education;
- Health and family planning;
- Welfare of SC and ST;
- Maintenance of municipal markets;
- Maintenance of monuments and historical places;
- Clearing Public Street and places; etc.

Acronyms

AADT	Average Annual Daily Traffic
AASU	All Assam Students Union
ABD	Area Based Development
ABITA	Assam Branch Indian Tea Association
ADT	Average Daily Traffic
AGCL	Assam Gas Company Limited
AHP	Affordable Housing in Partnership
AIDCL	Assam Industrial Development Corporation Ltd.
AIR	All India Radio
AL	Agriculture Land
AMC	Assam Medical Collage
AMCH	Assam Medical Collage & Hospital
AMR	Automated Meter Readers
AMRUT	Atal Mission for Rejuvenation and Urban Transformation
AMSL	Above Mean Sea Level
APDCL	Assam Power Distribution Company Limited
ASDMA	Assam State Disaster Management Authority
ASI	Archaeological Survey of India
ASTC	Assam State Transport Corporation
AUDA	Ahmedabad Urban Development Authority
AUIIP	Assam Urban Infrastructure Investment Program
BCPL	Brahmaputra Cracker and Polymer Limited
BDO	Block Development Officer
BGL	Below Ground Level
BIS	Bureau of Indian Standards
BLC	Beneficiary Led Construction
BMW	Bio-Medical Wastes
BOD	Biological Oxygen Demand
BOT	Built Operate and Transfer
BPL	Below Poverty Line
BRTS	Bus Rapid Transit System
BUL	Built Up Land
CBD	Central Business District
CDMP	City Disaster Mitigation Plan
CEO	Chief Executive Officer
CHPEEO	Central Public Health and Environmental Engineering Organisation
CIDCO	City and Industrial Development Corporation
CIDF	City Infrastructure Development Fund
CLSS	Credit Linked Subsidy Scheme
CNA	Central Nodal Agencies
CO	Circle Officer
COD	Chemical Oxygen Demand
CPCB	Central Pollution Control Board

CPHEEO	Central Public Health and Environmental Engineering Organisation
CPSU	Central Public Sector Undertaking
CPT	Central Place Theory
CPWD	Central Public Work Department
CRC	Central Relief Commissioner
CSMC	Central Sanctioning And Monitoring Committee
CSS	Centrally Sponsored Scheme
CT	Census Town
CTC	Crush-Tear-Curl
CVC	Classified Volume Counts
DBRT	Dibrugarh Town
DC	Deputy Commissioner
DCR	Development Control Regulation
DD	Deputy Director
DDA	Dibrugarh Development Authority
DDIPR	District Directorate of Information and Public Relations
DDMA	District Disaster Management Authority
DDMP	District Disaster Management Plan
DDPC	Dibrugarh District Planters' Club
DEM	Digital Elevation Model
DEOC	District Emergency Operational Centre
DIB	Dibrugarh
DIPRO	District Information & Public Relations Officer
DM	Disaster Management
DMB	Dibrugarh Municipal Board
DMP	Dibrugarh Master Plan
DMPA	Dibrugarh Master Plan Area
DNPL	Duliajan Numaligarh Pipeline Ltd
DP	Development Plan
DPR	Detail Project Report
DPT	Dibrugarh Town Protection
DTO	District Transport Office
DTP	Dibrugarh Town Protection
ECS	Equivalent Car Space
EDC	External Development Charges
ESR	Elevated Service Reservoir
ETP	Effluent Treatment Plant
EWS	Economical Weaker Section
FAR	Floor Area Ratio
FCI	Food Corporation of India
FMB	Field Measurement Book
FREMAA	Flood And River Erosion Management Agency Of Assam
FSI	Floor Space Index
GDCR	General Development Control Regulation
GHMC	Greater Hyderabad Municipal Corporation

GIS	Geographic Information System
GLSR	Ground Level Storage Reservoir
GOI	Government of India
GOSS	Ground Operational Support System
GTPUDA	Gujarat Town Planning and Urban Development Act
HCF	Heavy Chemical Factory
HCM	Heavy Construction Machinery
HCV	Heavy Commercial Vehicle
HDB	Housing and Development Board
HFAP	Housing for All Plan
HH	House Hold
HIG	Higher Income Group
HMV	Heavy Motor Vehicle
HQ	Head Quarter
HUDCO	High Voltage Distribution System
HVDS	Internal Development Charges
ICC	International Convention Centre
IDC	Internal Development Charges
IEC	Information, Education and Communication
IHHL	Individual Household Latrine
IIT	Indian Institute of Technology
IMD	India Meteorological Department
INR	Indian Rupees
INTACH	Indian National Trust for Art and Cultural Heritage
IPDS	Integrated Power Development Scheme
IPT	Intermediate Public Transfer
IRC	Indian Road Congress
ISBT	Inter-State Bus Terminus
ISRO	Indian Space Research Organisation
ISSR	In-situ Slum Rehabilitation
IT	Information Technology
ITI	Industrial Training Institute
KLD	Kilo Litre per Day
KM	Kilo Metre
KV	Kilo Volt
LARR	Land Acquisition, Rehabilitation and Resettlement
LAX	Los Angeles International Airport
LCV	Light Commercial Vehicle
LIC	Life Insurance Corporation
LIG	Low Income Group
LMV	Light Motor Vehicle
LPCD	Litre Per Capita per Day
LPG	Liquefied Petroleum Gas
LPS	Land Pooling System
MAV	Multi Axle Vehicle

MB	Municipal Board
MCV	Medium Commercial Vehicle
MFF	Multitranchise Financing Facility
MFZ	Multi Functional Zones
MHA	Ministry of Home Affairs
MIG	Medium Income Group
MLA	Members of the Legislative Assembly
MLD	Million Liter per Day
MMRDA	Mumbai Metropolitan Region Development Authority
MNC	Multinational Corporation
MNES	Ministry of Non-Conventional Energy Sources
MP	Member of Parliament
MPA	Master Plan Area
MSL	Mean Sea Level
MSME	Micro Small and Medium Enterprises
MSW	Municipal Solid Waste
MT	Metric Tonnes
MW	Mega Watt
NAAC	National Assessment and Accreditation Council
NAMP	National Air Quality Monitoring Programme
NBC	National Building Code
NBSS	National Bureau of Soil Survey
NCC	National Cadet Corps
NDMA	Nagaon Disaster Management Authority
NDRF	National Disaster Response Force
NE	North-East
NERPSIP	North Eastern Region Power System Improvement Project
NGO	Non Governmental Organization
NH	National Highway
NHAI	National Highways Authority of India
NHB	National Housing Bank
NMT	Non Motorised Transport
NNRMS	National Natural Resources Management System
NPV	Net Present Value
NRL	Numaligarh Refinery Limited
NRSC	National Remote Sensing Centre
NSS	National Service Scheme
NTU	Nephelometric Turbidity unit
NUSI	National Union of Seafarers of India
NWMP	National Water Monitoring Program
OD	Origin- Destination
OG	Out Growth
OHT	Over Head Tank
PCB	Pollution Control Board
PCBA	Pollution Control Board Assam

PCR	Police Control Room
PCU	Passanger Car Unit
PET	Polyethylene Terephthalate
PHC	Public Health Centre
PHE	Public Health Engineering
PIA	Public Interest Area
PLU	Proposed Land Use
PMAY	Pradhan Mantri Awas Yojana
PPH	Person Per Hector
PPP	Person Per Household
PPPP	Public Private Partnership
PSP	Public & Semi-Public
PUC	Pollution Under Control
PWD	Public Work Department
PWRD	Public Work Road Department
PWSS	Pipe Water Supply Scheme
RAY	Rajivgandhi Awas Yojana
RCC	Reinforced Cement Concrete
RERA	Real Estate Regulatory Authority
ROB	Road Over Bridge
ROW	Right of Way
RRT	Rapid Response Team
SAR	Search & Rescue
SC	Scheduled Caste
SDO	Sub Divisional Officer
SDRF	State Disaster Response Force
SHG	Self Help Group
SLSMC	State Level Sanctioning and Monitoring Committee
SOP	standard Operating Procedure
SPV	Special Purpose Vehicle
ST	Scheduled Tribe
STP	Sewerage Treatment Plant
SW	Solid Waste
SWM	Solid Waste Management
SWTP	Solid Waste Treatment Plant
TC	Town Committie
TDR	Transferable Development Right
TDS	Total dissolved solids
TIF	Tax Increment Financing
TOD	Transit Oriented Development
TP	Town Planning
TPD	Tonnes Per Day
TPETC	Tai Phake Eco-tourism Camp
TPS	Town Planning Scheme
TSDF	Treatment Storage and Disposal Facility

TVC	Traffic Volume Count
UDAY	Ujwal DISCOM Assurance Yojana
ULB	Urban Local Body
UNCHS	United Nations Centre for Human Settlements
UNDP	United Nations Development Programme
URDPFI	Urban and Regional Development Plans Formulation and Implementation
UT	Union Territory
VAMBAY	Valmiki Ambedkar Awas Yojana
VCF	Value Capture Finance
VLMCC	Village Land Management and Conservation Committee
VLT	Vacant Land Tax
WFPR	Work Force Participation Rate
WPR	Workforce Participation Rate
WTE	Waste-to-Energy
WTP	Water Treatment Plant

